UNEP

industry and environment

ISSN 0378-9993
Industry and Environment
Volume 27 No. 4
October – December 2004

A publication of the United Nations Environment Programme
Division of Technology, Industry and Economics

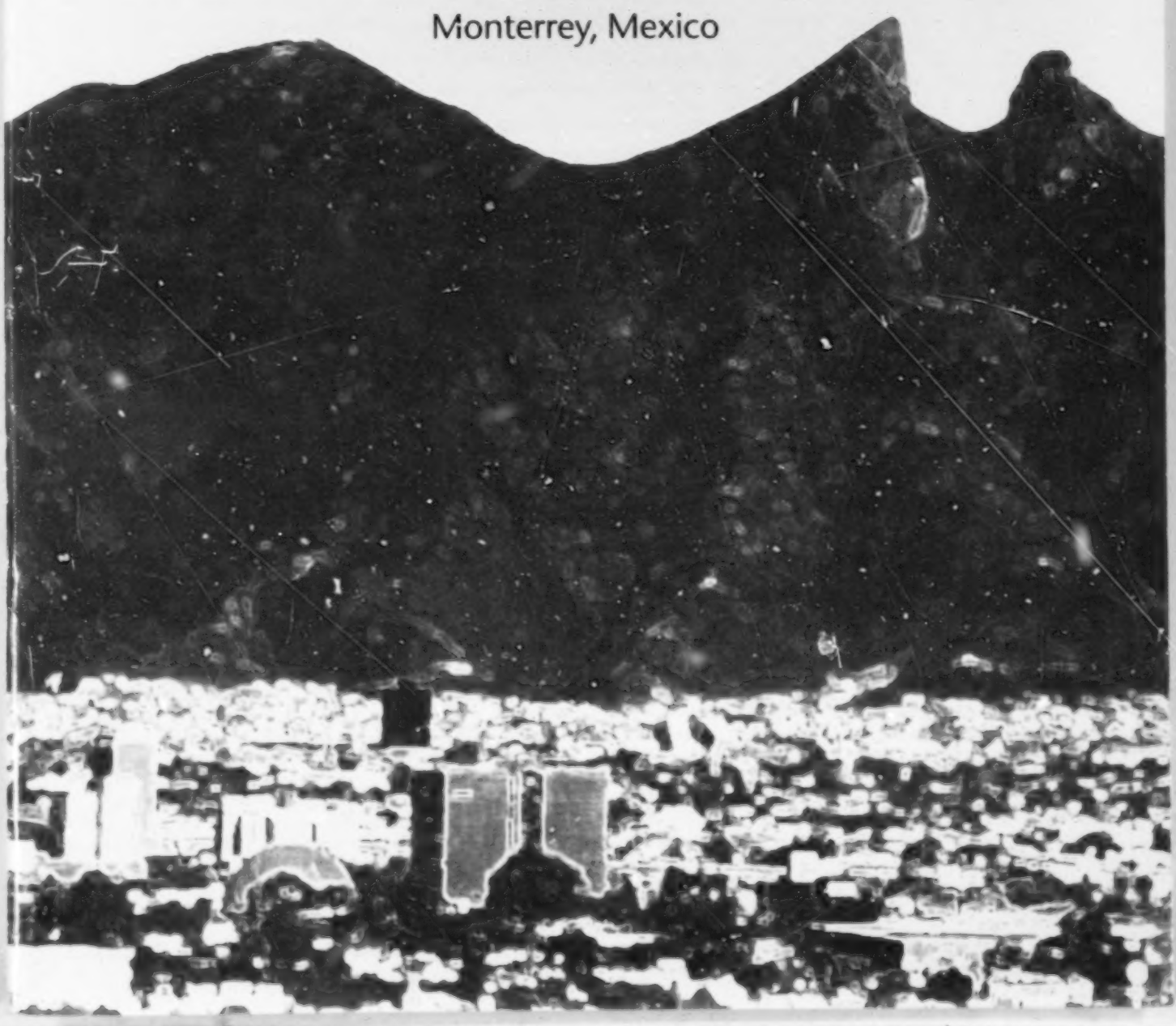
Une publication du Programme des Nations Unies pour l'environnement
Division Technologie, Industrie et Economie

Una publicación del Programa de las Naciones Unidas para el Medio Ambiente
División de Tecnología, Industria y Economía

Cleaner Production

8th International High-level Seminar on Sustainable Consumption and Production

Monterrey, Mexico



Industry and Environment is a quarterly review published by the United Nations Environment Programme Division of Technology, Industry and Economics (UNEP DTIE), Tour Mirabeau, 39-43 quai André-Citroën, 75739 Paris Cedex 15, France. Tel: +33 1 44 37 14 50; Fax: +33 1 44 37 14 74; E-mail: unep.tie@unep.fr; www.uneptie.org

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Industry and Environment is available on-line at www.uneptie.org.

Industry and Environment is printed on 100% chlorine free paper.

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Editorials

8th International High-level Seminar on Sustainable Consumption and Production

Klaus Toepfer
UNITED NATIONS UNDER SECRETARY-GENERAL AND EXECUTIVE DIRECTOR, UNEP (FROM HIS OPENING ADDRESS)

The world is facing burgeoning problems – poverty, hunger, disease and environmental degradation. Mandates for action (the most recent being the Plan of Implementation from the World Summit on Sustainable Development, and the UN Millennium Goals) are there. We – governments, business and civil society – have committed to make change a reality. Our challenges now lie in the speed with which we move ahead. We need to do the job faster because people's lives and the health of the planet are at stake. Over the next two days I want you to discuss and identify concrete and practical areas of work – projects, initiatives, partnerships – that can bring about change at ground level, and that can create models for others to adapt, improvise and follow. The focus has to be on implementation.

I would like to thank the Government of Mexico for hosting SCP8, one of the many on-going efforts to promote more sustainable patterns of consumption and production. This event will take stock of the concrete progress being made in the areas of water, energy and agriculture. It will also focus on the potential offered by working through consumers, sustainable resource use and designing alternative models for development. From the outset, let us agree that we are here to find practical solutions and the means to implement them.

Allow me a moment to offer a brief reflection on the high-level seminars. This is not the first one at which I have officiated. Previously they went under the title of Cleaner Production. Now they reflect the full Sustainable Consumption and Production agenda included in the Ten-Year Framework. The Ten-Year Framework is the result of Johannesburg, and was endorsed by the Global Environment Ministerial Forum and by UNEP's Governing Council last year.

I am very proud to note that UNEP has long championed cleaner production, and the complementary consumption-oriented activities, since before they appeared on the global agenda. It is our role. There is no need to mention the importance of integrating consumption and production. It is the basis for our work. Work in these areas has progressed enormously. This high-level seminar attests to that.

Let me remind you that the vocabulary we use to define and take action – eco-efficiency, cleaner production, sustainable consumption and production, circular economy, and I could go on – is the vocabulary that has evolved to describe how to get the job done. ◆

Alberto Cárdenas Jiménez
SECRETARY OF ENVIRONMENT AND NATURAL RESOURCES, MEXICO

In accordance with our countries' commitments, stated in the Rio Declaration and the Johannesburg Plan of Implementation, environmental issues should be integrated with development processes in order to attain sustainable development.

Population growth, as well as unsustainable production and consumption patterns, result in waste accumulation and pollutant release to the environment.

In the last 50 years, the world's population has grown from 2.5 to 6.1 billion. Mexico's population has quadrupled. Production, measured in terms of the exploitation of natural resources, has been greater than the use of renewable and non-renewable natural resources during the rest of the history of humankind.

The pressure exerted on natural resources is moving our sustainability goals further away. The rate of technological change is far behind population growth and demand for production goods. Production and consumption patterns continue to be determined without taking into account either environmental or social costs, even if their adverse effects on biodiversity, ecosystems and the environment are already being experienced worldwide.

We must all, as consumers, be conscious of environmental damage. Neither changing consumption patterns nor technological change is enough on its own to reverse the present unsustainable tendency. We need to work on both sides of the equation to improve the quality of our daily life and assure the permanence of our natural resources.

We must learn to consider environmental protection and sustainable use of natural resources as part of production and consumption patterns. Not only are they the foundation of every production chain, but sustainable environmental management presents numerous economic opportunities. Because human development should only be based on sustainability, considering it as part of the equation will result in social welfare.

It is therefore necessary to re-address production processes, service offers and consumer demands, as key points for pushing forward the sustainable development agenda. We must go even further, not only looking at cleaner production but also at sustainable consumption, with a renewed approach based on planning and prevention.

We have an enormous task in front of us: to promote and apply these concepts, to develop information systems and build capacities, and to adjust management and policy frameworks in order to change our societies' behavioural patterns.

During SCP8 in Monterrey we exchanged our different points of view on these subjects, looking for a change in our "common way of life model" to attain a "life quality model". Achieving this goal will require the participation and commitment of each one of us. Our challenge is to make the proposals of this meeting become a reality that will contribute to the sustainable future of humanity.

Mexico's offer to host UNEP's 8th International High-level Seminar on Sustainable Consumption and Production reflects the active interest and commitment the administration of President Vicente Fox has taken in attaining sustainable development, including the promotion of sustainable patterns of consumption and production. Therefore, it was a great honour for our country to host this important event.

SCP8's analysis and conclusions are of vital importance because they will promote the implementation of concrete actions in business groups, companies, governmental agencies and international organizations.

This is a challenge we must face today. As outlined at the WSSD and in the United Nations Millennium Development Goals, we can no longer leave it for the future. ◆

Introduction

Monique Barbut
DIRECTOR, DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS, UNEP
(FROM HER OPENING ADDRESS)

The 2002 World Summit on Sustainable Development (WSSD) called for a Ten-Year Framework on sustainable consumption and production, building on activities already under way at the regional and national level. As follow-up, UNEP and UN DESA have organized consultative meetings in several regions (so far, Asia, Latin America, Africa, the Baltic States, and one in Europe set for ten days from now).

These regional meetings have reconfirmed the interest of governments and other stakeholders in taking an integrated sustainable consumption and production approach. SCP is now seen as a promising agenda by both developed and developing countries – contributing to economic growth and poverty alleviation and improving the quality of life. In fact, it is seen as a necessity, the only way forward. This approach will check the increasing demand on the extraction of natural resources and combat the burgeoning problem of waste from the production and consumption of goods.

But we have to do more than organize meetings. We need to demonstrate and implement sustainable patterns of production and consumption. The project started in Guiyang, China, is one such example. Initiatives are being taken elsewhere as well. The Circular Economy Initiative in China and the Recycling Based Society Initiative in Japan are other examples. We need to formulate more local-level projects and raise resources to implement them. Such tests or demonstration projects will then have to be adapted and replicated. For this we need to build capacity, prepare guidelines and train people. Institutions like the National Cleaner Production Centres, many of which are represented here, play a crucial role.

These projects and capacity-building exercises address the basic themes associated with Environment and Development – water, energy and agriculture. Finding solutions will require the involvement of all stakeholders, not only governments but also financial institutions, technology developers, product designers (from fashion designers to technical designers), the media and advertising, retailers, consumers and so on.

It is this thought process which has led us, UNEP, to develop the format of this seminar on different lines than previous ones. Allow me to reiterate a message that is not new: we are of one world. The root causes of global environmental degradation are embedded in the social and economic problems of poverty, unsustainable production and consumption patterns, inequity in distribution of wealth, etc. Success in combating these problems is dependent on the full participation of all actors in society – including youth, tomorrow's decision-makers and consumers.

We have the challenging task of determining what we should do: UNEP – and *you*, industry, government and societal decision-makers. What we can do and what we will commit to do.

We are gathered here to assess the progress that has been made and where we stand. We are also here to identify what remains to be done and who needs to undertake what. As a group we are diverse, numbering over 240, coming from government, industry and civil society. We represent over 60 countries.

We have the potential to leave here in new or expanded partnerships ready to take action. The results of the two days of discussion will establish the road map for our activities at the local, national and international level (particularly for UNEP), in order to foster the shift towards sustainable patterns of consumption and production. ◆

Acknowledgements

UNEP would like first of all to thank the Government of Mexico, particularly Alberto Cárdenas Jiménez, Secretary of the Environment and Natural Resources, for hosting the 8th International High-level Seminar.

Special thanks are also owed to the Tanzanian Environment Minister, Arcado Ntagazwa (Minister of State, Office of the President), a long-term proponent of SCP concepts in his country. UNEP is grateful for Tanzania's offer to host the 9th International High-level Seminar in 2006. This will be the first time a seminar in this series has taken place in Africa.

In all, five Environment Ministers were present at SCP8. The other three were: Atilio Savino, Secretary of Environment and Sustainable Development, Ministry of Health and Environment, Argentina; Carlos Arturo Harding Lacayo, Minister of Environment and Natural Resources, Nicaragua; and Carlos Loret de Mola de Lavalle, President, National Council of Environment, Peru.

Lester Brown, President of the Earth Policy Institute in the United States, delivered the seminar's keynote address. Other keynote speakers included: Mr. Ntagazwa; Jaime Lomelin, General Director, Industrias Peñoles, Mexico; Suresh Prabhu, Member of Parliament, Lok Sabha, India; George D. Carpenter, Director, Corporate Sustainable Development, Procter and Gamble, United States; and Annemieke Wijn, Senior Director, Commodity Sustainability Programmes, Kraft Foods Inc., Germany.

The staff of Mexico's Ministry of Environment and Natural Resources (SEMARNAT) worked with UNEP for months in advance to ensure that the seminar would be successful. We also acknowledge the invaluable support of the Instituto Para la Proteccion Ambiental de Nueva León.

Finally, UNEP would like to express its gratitude to all the representatives of governments, business, NGOs, academic institutions, financing organizations and other bodies who served as chairs, speakers, panellists and rapporteurs and took part in discussions during the plenary and parallel sessions.

Presentation and background

Two main themes – "Environment and Basic Needs" and "Global Challenges and Business" – were the focus of the 8th International High-level Seminar on Sustainable Consumption and Production (SCP8) in Monterrey.

This invitational two-day UNEP seminar was organized around three specific objectives:

- selection of *methodologies, approaches, projects and funding mechanisms* that can be replicated and used to change unsustainable patterns of production and consumption;
- building new *partnerships* to share and leverage resources and facilitate the implementation process;
- identifying *priority activities* and means for UNEP and other organizations mandated to implement the sustainability agenda.

The papers presented at Monterrey (as well as discussions during the plenary and parallel sessions) addressed the interrelated Environment and Development themes of sustainable use of water, sustainable use of energy, and sustainable agriculture. These themes are also addressed in the articles that appear in this issue of *Industry and Environment*. In most cases, the articles are revised versions of papers given at the seminar, with participants' comments and contributions taken into account.

At the seminar's conclusion, participants agreed on 16 issue-specific Recommendations (see p. 6). These include recognition of:

- the need to strengthen links between the SCP agenda and other development priorities (e.g. poverty reduction, access to basic services);
- the need for governments to take the lead in developing appropriate policy frameworks;
- the need for business to become more active in SCP implementation;
- the roles of financial institutions, National Cleaner Production Centres (NCPCs), international organizations and other bodies in regard to SCP;
- the need to engage youth in SCP initiatives;
- the need for more resource efficient technologies, products and services;
- the need to share, replicate and implement alternative development models.

The seminar Recommendations will feed into UNEP's February 2005 Governing Council Session, where progress on the sustainable consumption and production agenda will be reviewed.

The first seminar in this series took place in Canterbury (United Kingdom) in 1990. Subsequent seminars were held in Paris (France) in 1992, Warsaw (Poland) in 1994, Oxford (United Kingdom) in 1996, Phoenix Park (Korea) in 1998, Montreal (Canada) in 2000 and Prague (Czech Republic) in 2002. Tanzania will host the 10th High-level Seminar in 2006.

For more information about the work of UNEP DTIE's Consumption Branch, including activities related to sustainable consumption and production, see: www.uneptie.org/pc/home.htm. ◆

We – governments, business, and civil society – have committed to make change a reality. Our challenges now lie in the speed with which we move ahead.

We need to do the job faster because people's lives and the health of the planet are at stake. Let us not forget the goal – the ultimate focus of these efforts is the poor – those who do not have access to basic services, such as clean water, food, and energy, and who are exposed to health risks due to improper waste management. They need to become consumers. For others, there is the need to consume differently – with less environmental and social impact on the world.

We need to create the "space" for a better quality of life for all.

Klaus Toepfer
Executive Director, UNEP

Recommendations

8th International High-level Seminar on Sustainable Consumption and Production

15-16 November 2004, Monterrey, Mexico

Building on the WSSD mandate to develop a ten-year framework on sustainable consumption and production, and the activities already initiated under the Marrakech process, as well as taking into account the global priorities identified in the Millennium Declaration, SCP8 participants agreed to endorse the following recommendations:

1 Concretize and strengthen the SCP agenda and its links with other development priorities, such as poverty reduction, access to basic services including access to water, energy and food, and economic development.

Key actions:

- Develop a common SCP language, including indicators, benchmarks and surveys.
- Develop and share case studies on successful SCP initiatives.

2 Governments should take leadership by building appropriate policy frameworks, including economic, regulatory and social instruments.

Key actions:

- Integrate SCP in poverty reduction, economic, trade and financing, and social policies.
- Support initiatives on (public) green procurement programmes, triple-bottom-line reporting, and corporate environmental/social responsibility.

3 Business should become more active in SCP implementation.

Key actions:

- Establish concrete partnerships between UN and multinational corporations to support specific projects in developing countries.
- Encourage large organizations to assist small and medium-sized enterprises in implementing SCP through the use of tools such as greening the supply chain.
- Support business and engineering schools in integrating SCP curricula into higher-level education.

4 Financial institutions should create favourable financial conditions and a stable and competitive economic framework for SCP investments.

Key actions:

- Establish partnerships with business and governments to develop financing strategies for investments in SCP activities, in particular for SMEs.
- Mainstream green accounting for business and governments to internalize environmental costs.

5 NCPCs and similar organizations should strengthen their role by expanding the traditional CP focus on processes to also include products and services and address poverty reduction and other development goals.

Key actions:

- Develop NCPCs' service packages as "total solutions" to their core clients (business) and include tools like product and service design, life-cycle management, corporate social responsibility reporting, marketing, and access to funding sources.

6 International organizations should expand the SCP stakeholder group by involving intermediary organizations between producers and consumers, in particular in retail and marketing.

Key actions:

- Establish partnerships at global and national levels with retailers, distributors, and marketing agencies
- Collect lessons learned from successful campaigns seeking to change consumer behaviour and apply them for SCP.

Water

7 Policies and strategies to provide access to water for all should be adopted at all levels, and need to recognize the importance of efficient water management, development of new water infrastructure, and demand side management.

Key actions:

- Establish public-private partnerships as a key element in water sector development strategies.
- Apply tools, such as revenues generation, costs management, and future revenue-based financing, to mobilize finance for the development of the required infrastructure.
- Support programmes for improved demand side management and reduced distribution losses, through improved pricing, metering and fee collection systems.
- Enhance developing countries' capacities for the development and implementation of integrated water resource management programmes.

Energy

8 Build capacity at the local level, including local authorities, entrepreneurs, and banks, to develop sustainable energy systems that take into account local resource availabilities and energy needs.

Key actions:

- Develop awareness and willingness amongst local banking and community financing schemes (including seed funds, installation and growth capital) with the active involvement of local entrepreneurs.
- Expand the services of NCPCs to the provision of energy services and local financing support through the development of green funding programmes.

9 Promote sustainable energy systems as an attractive solution for business development.

Key actions:

- Develop energy business models for the promotion of alternative energy resources into existing energy regimes.
- Develop education curricula on energy development and management with a particular focus on business schools.

10 Develop a marketing strategy for sustainable agriculture, so as to educate buyers, engage producers and generally improve the image of sustainable agricultural products.

Key actions:

- Develop guidelines and case studies explaining how sustainable agriculture may be translated to realistic and practical on-the-ground action.
- Develop a business case showcasing proven benefits from sustainable agriculture through benchmarking of benefits, Business to Business (B2B) benefits, and benefits to intermediaries.

11 Establish continuous improvement through better practices as a more realistic model for achieving a transition to sustainable agriculture than immediate adoption of best practices.

Key actions:

- Support transfer of established sustainable agriculture practices, highlighting the process for adopting these.
- Work with governments to provide incentives for producers/farmers to start the transition.
- Secure financing mechanisms to assist companies in the transition period.

Consumption

12 Communication on sustainable consumption needs to be in simple language, highlighting the benefits that would come from changed consumption patterns, not only for the environment, but also in terms of improving health, price, and comfort.

Key actions:

- Develop partnerships with advertising agencies and the media to explore strategies to integrate SCP into the messages transmitted to consumers.
- Icons, such as sport stars and artists, would need to be mobilized to help communicate sustainable consumption as a "cool" lifestyle, including sports and leisure perspectives.
- Establish means of engaging youth in SCP in a modern fashion such as the UNEP-UNESCO youthXchange programme, which should be updated and translated to additional languages.
- Communicate SCP to the elderly, and explore opportunities for engaging existing organizations for senior citizens in SCP promotion campaigns.

Resource use, technology, and products

13 Create systematic conditions that favour resource efficient technologies, products, and services.

Key actions:

- Develop mechanisms to foster rapid access, adaptation, and implementation of clean and resource efficient technologies, particularly in small and medium-sized enterprises.
- Initiate sustainable procurement programmes at governmental and company levels, so as to create a market for sustainable products.
- Develop recognition mechanisms for sustainable products, such as marketing, testing, and labelling of products
- Engage national level education authorities to integrate SCP in technical educational curricula at all levels.

14 Expand the traditional CP focus on processes at the plant level to the industrial cluster, community, and national levels.

Key actions:

- Identify and share strategies for establishing system-wide cooperation at the industrial cluster level, the community level, and the national level.
- Motivate large companies, through partnerships, case studies, recognition of champions, and the use of existing initiatives such as the Global Compact, to integrate technology sharing with smaller companies as a component of their CSR strategy and standard in their business manuals.

15 Business models on the development and implementation of alternative development models conducive to SCP need to be shared and replicated.

Key actions:

- Compile and consolidate existing experiences on alternative development models and make them available for further replication.
- Strengthen the engagement of the private sector in multi-stakeholder efforts of promoting sustainable consumption and production at different levels.

16 Promote the implementation of alternative development models, specifically replicating community and local initiatives such as the circular economy in China and zero emission initiatives.

Key actions:

- Enhance capacities for an integrated assessment of sustainable development.
- Develop a mechanism that would facilitate the integration of alternative development models in existing strategy frameworks such as "cities development strategies" and "national poverty reduction and sustainable development strategies".

The Ten-Year Framework for sustainable consumption and production: current status

One outcome of the World Summit on Sustainable Development in Johannesburg in September 2002 was the call to promote and develop a Ten-Year Framework of Programmes on Sustainable Consumption and Production *in support of regional and national initiatives.*

A regional consultation process to identify priorities has therefore been implemented by UNEP and the UN Department of Economic and Social Affairs (UN DESA). In 2003 and 2004 regional meetings were held in Africa, Asia-Pacific, Europe, and Latin America and the Caribbean. These meetings were organized with the host countries (Argentina, Belgium, Indonesia, Lithuania, the Kingdom of Morocco, Nicaragua and the Republic of Korea). Belgium, Denmark, Germany, Finland, The Netherlands, Norway, Sweden and the European Commission provided financial support.

A first international review meeting was organized in Marrakech, Morocco, in June 2003. *Subsequently, it was decided to refer to this framework as the Marrakech process.* It was also decided that this process "should be supported by informal task forces or round tables on sustainable consumption and production, with participation of experts from developing and developed countries." UNEP's SCP8 seminar was one of those informal supporting events. Others include the regional roundtables on sustainable consumption and production held in Africa, Europe and Asia-Pacific.

The consultation so far has resulted in a preliminary set of priorities for regional action (see www.uneptie.org/sustain). These will be further developed in future consultative meetings. The second international review meeting of the Marrakech process will take place in Costa Rica on 5-8 September 2005. It will review work at the national, regional and international level.

For **developed countries**, the Marrakech process serves as an inspiration to strengthen existing policies that promote sustainable consumption and production, including by:

- giving new impetus to the implementation of economic and legal instruments;
- mainstreaming communication and education campaigns;
- concretizing integrated product policies;
- further developing the third pillar of sustainable development (social progress, including labour conditions).

These, in particular, were among the conclusions of the first European Stakeholder Meeting on Sustainable Consumption and Production, held in Ostend, Belgium, on 25-26 November 2004 (see UNEP DTIE Highlights, p. 50).

Developing countries have expressed an interest in using the Marrakech process as a mechanism to strengthen policies to eradicate poverty and create jobs, contributing to human development and related Millennium Development Goals "through the market".

Overall, a framework needs to be developed that delivers tangible outcomes to raise the standard of living of the poor, as well as a concrete demonstration of strengthened implementation of projects in developed and rapidly developing countries, enabling the latter to leapfrog to sustainable consumption and production patterns.

"Plan B": the rescue of a planet and a civilization[1]

Lester Brown, Earth Policy Institute, 1350 Connecticut Ave. NW, Washington, DC 20036, USA (epi@earth-policy.org)

Summary
Falling water tables, rising temperatures, soil erosion and desertification are likely to result in increasing food prices. A doubling of world grain prices could disrupt global economic progress, and this in turn could be the world's wake-up call. At that point it would be clear that "Plan A" – business as usual – cannot work much longer. The three principal components of "Plan B" are: increasing global water productivity; putting the brakes on population growth; and reducing carbon emissions to stabilize the climate.

Résumé
La baisse des nappes phréatiques, l'élévation des températures, l'érosion des sols et la désertification risquent de provoquer une augmentation du prix des produits alimentaires. Le doublement des prix mondiaux des céréales pourrait perturber le progrès économique mondial, ce qui pourrait à son tour être un véritable coup de semonce pour le monde. A ce stade, il est clair que le « Plan A » (faire comme à l'ordinaire) ne sera plus possible. Les trois principaux volets du « Plan B » sont : accroître la productivité de l'eau dans le monde ; freiner la croissance démographique ; réduire les émissions de carbone pour stabiliser le climat.

Resumen
El descenso de las capas freáticas, el aumento en las temperaturas, la erosión de los suelos y la desertificación podrían causar el aumento de los precios de los alimentos. Un incremento de 100% en los precios internacionales de los granos podría interrumpir el progreso económico alrededor del mundo y nos obligaría a tomar conciencia de la magnitud del problema. Para entonces, quedaría claro que el "Plan A" (las prácticas convencionales) dejaría de ser funcional en poco tiempo. Los tres principales elementos del "Plan B" son: incrementar la productividad hidráulica; frenar el crecimiento poblacional, y reducir las emisiones de carbono para estabilizar el clima.

Those of us who've been working on environmental issues for many years have been saying for some time that if the environmental trends of recent decades continue, eventually we'll be in trouble. What was not clear is the form the trouble would take, and when it would come. I now think it's going to come on the food front, in the form of rising world food prices, and within the next few years.

In four of the last five years, world grain production has fallen short of consumption. We have covered these four years of shortfall by drawing down world grain stocks, which are now at the lowest level in 30 years. The last time grain stocks were this low, in 1972-74, world wheat and rice prices doubled. Apart from soil erosion and desertification – about which I could say much, were there more time – there are two relatively new environmental reasons for the shortfall and the resulting decline in stocks and food security: falling water tables, and rising temperatures.

Falling water tables

As world demand for food has tripled over the last half century, the demand for irrigation water has also tripled. In many parts of the world this has led to the overpumping of aquifers. Half of the world's people now live in countries where water tables are falling and wells are running dry. These countries include China, India, and the United States, the three big grain producers that together account for nearly half of the world grain harvest.

Most of us do not realize how water-intensive food production is. We drink, each day, in one form or another – as water, juice, milk, pop, beer, coffee – nearly four litres of water a day. And the food that we eat each day requires 2000 litres of water to produce, or 500 times as much. It takes a lot of water to produce food. Most of us have not yet connected the dots to see that water shortages equal food shortages: 70% of all the water we use is for irrigation; industry uses 20% and cities 10%. So, falling water tables mean shrinking harvests.

Rising temperatures

The second trend affecting food production is rising temperatures. New research by crop ecologists at the International Rice Research Institute in the Philippines and the US Department of Agriculture indicates that for each one degree Celsius (1.8 degrees Farenheit) rise in temperature during the growing season, we can expect a 10% decline in yields of wheat, rice, and corn. In 2002, intense heat and drought reduced the grain harvest in India and the United States. Last year, Europe bore the brunt of intense heat. Every country from France east through the Ukraine saw its grain harvest decline as a result of intense heat during the last half of the summer.

The rise in temperature appears to be accelerating; the four warmest years on record have come in the last six years. Temperature does not go up every year; in some it actually declines somewhat. But CO^2 levels, which we can measure with great precision, rise every year – the most predictable environmental trend there is.

The International Panel on Climate Change is projecting that average temperatures will rise somewhere between 1.4 and 5.8 degrees Celsius – the latter is over 10 degrees Fahrenheit – during this century. Some people recently born may live to see a planet that on average is 10 degrees warmer than it is today. It's going to make it much more difficult for farmers to keep up with the demand, to feed the 74,000,000 people being added to the world population each year, with water tables falling and temperatures rising.

The wake-up call: food prices

I think the wake-up call is going to come in the form of rising food prices. The event that I expect will trigger this dramatic rise in food prices will be when China comes into the world market for massive quantities of grain. Between 1950 and 1998, China increased its grain production from 90,000,000 tonnes to 392,000,000 tonnes. But since 1998, its grain production has dropped to 322,000,000 tonnes. The causes are spreading water shortages, the conversion of cropland to nonfarm use, and the new Chinese love affair with the automobile. The two million new cars sold in China last year require paving the equivalent of 100,000 football fields in highways, roads, and parking lots.

Thus far, China has been covering the decline in its grain production largely by drawing down its once massive stocks of grain, but they are now largely depleted. For wheat, it has already turned to the world market. Wheat buying delegations from China to Australia, the United States, and Canada have bought 9,000,000 tonnes of wheat since the beginning of November 2003, automatically making China the world's largest wheat importer. When China comes into the world market for 30-50 million tonnes of grain – more than any other country imports by far – it will necessarily come to the United States, because the United States controls close to half of the world's grain

exports. We're looking at a fascinating geopolitical situation where 1.3 billion Chinese consumers, with a trade surplus with the US of $120 billion (enough to buy the entire US grain harvest twice) will be competing with us for our grain, driving up our food prices.

Now, remember we started with environmental trends like falling water tables and rising temperatures. These trends, then, have an economic effect – rising food prices. A doubling of grain prices following a sharply reduced harvest, which is a distinct possibility, would destabilize governments in a multitude of low-income countries that import a substantial amount of grain. This political instability could disrupt global economic progress. At that point, we might realize that we can no longer continue to neglect the environmental trends that are undermining our future. That, I think, may be the wake-up call – there is no economic indicator that is more politically sensitive than food prices.

At that point we're going to have to make some decisions, and I'm convinced that Plan A – business as usual – is simply not going to work much longer. So we look elsewhere. The three principal components of a "Plan B" that I outline in my book with that title are: a global "full-court press" to raise water productivity; putting the brakes on population growth; and reducing carbon emissions by 50% to stabilize climate over the next decade.[2]

Raising water productivity

In regard to raising water productivity, I'll just cite a few examples. We have a number of irrigation techniques with varying degrees of efficiency, and we need to take a look at these – flood irrigation versus drip irrigation, for example. Flood irrigation takes a lot of water. Drip irrigation takes much less.

In cities we've inherited, in engineering terms, a system where water enters one side of the city and leaves on the other side. The water is only used once, and it's gone. However, Singapore, for example, which has to buy its water from Malaysia, is beginning to recycle its urban water supply. We have the technologies now to do that. Cities don't need to consume a lot of water; they can just keep using it over and over. This is an example of the kind of rethinking we need to do.

Slowing population growth

On the population front, there are two things we need to do. First, we need to fill the family planning gap. We need to make sure that every woman in the world has access to family planning services and reproductive healthcare.

The second thing we need to do is create the social conditions that will facilitate a shift to smaller families. That means investing in education for both girls and boys. And it means advancing the UN Millennium Goal of universal primary school education worldwide by 2015. We also need to organize school lunch programmes for the poorest countries: first, it helps to get the kids into school, and second, it's very difficult to learn if you haven't eaten all day. The costs of family planning services, reproductive healthcare, universal primary school education, school lunch programmes and basic village-level healthcare in the poorest countries would come to an additional $62 billion a year.

For the first time in history, the world has the resources to eradicate poverty everywhere if we want to do so. I think the time has come.

Stabilizing the climate

If it becomes clear that rising temperatures are shrinking harvests and driving up food prices, we will suddenly have a powerful new lobby for doing so, namely consumers. The way to stabilize climate is by cutting carbon emissions through reduced demand for energy. Let me use a couple of examples to illustrate how we can do so rapidly. First, we could phase out all old-fashioned, inefficient incandescent light bulbs and replace them with compact fluorescent bulbs that use only a third as much electricity.

And second – how many of you have ridden in a Toyota Prius? It's a remarkable piece of automotive engineering with its gasoline-electric hybrid engine and something like 55 miles per gallon on average. If, over the next decade, we were to raise the fuel efficiency of the US automobile fleet to that of the Prius today, we would cut gasoline use in half. No change in the number of cars or the number of miles driven, just doing it with much more efficient technology. And it's not technology we have to invent – it's on the road now. We just need to expand production.

Wind power

I've covered some of what we can do to reduce energy use on the demand side, in fossil fuel use. On the supply side, we have a number of renewable sources with a lot of potential: wind, solar, geothermal and, in some places, biomass. Worldwide wind-electric generation has been expanding by 30% a year since 1995, an increase of fivefold or so. The European Wind Energy Association projects that by 2020, half of Europe could be getting its residential electricity from wind power. If European governments get serious about developing their offshore wind capacity, by 2020 Europe could be getting all of its residential electricity needs from wind.

In the United States, there are now commercial wind farms in 22 states that are feeding electricity into the grid. In 1991, the US Department of Energy pointed out that three of our 50 states, North Dakota, Kansas, and Texas, had enough harnessable wind energy to satisfy national electricity needs. And that was based on the limited technologies of 1991. Advances in wind turbine design since then enable turbines to convert wind into electricity more efficiently, and they harvest a much larger amount. Whereas the average wind turbine in 1991 was around 120 feet tall, the ones going in today are 300 feet. Not only are they on a larger scale, but the wind is much stronger up there.

Wind has an enormous potential. There are six reasons why it's doing so well: it's abundant, cheap, inexhaustible, widely distributed, clean and climate-benign. No other energy source has all those attributes. So I think we're going to see wind becoming the centrepiece of the new energy economy.

Wind energy is cheap, it will be cheap, and it's inexhaustible. Once you make the investment, it will last forever.

Hybrid engines

If we strengthen our electric grid and actually construct a national grid, tying the regional grids together, with a capacity to move electricity not only within regions but among them, then we can invest heavily in wind farms all over the country that feed into the grid. If you take a car designed like a Toyota Prius with a hybrid engine, add a second battery, and plug it in sometime between 1 and 6 am when electricity demand drops but the wind continues to blow, you can recharge. You wouldn't need to use any gasoline at all for short commutes. You'd still have the gasoline capacity and the gas-electric hybrid, so if you want to go for a long drive on the weekend, 200 or 300 miles or whatever, you could do it, no problem. In fact, it only takes half a tank with a hybrid engine because it's so efficient. The point I want to make is that we now have the technologies needed to largely power our fleet of automobiles with wind energy.

In recent years I have emphasized the evolution of the hydrogen economy. Fuel cells are quite efficient, but the advantage of the system I just mentioned is that the electricity is used directly to power the automobile. If you use the hydrogen fuel cell, the wind generates electricity, which electrolyzes water, which produces hydrogen, which runs a fuel cell, which generates electricity. At each stage there's a loss in efficiency. So now there's a growing shift in thinking among the people in the energy field that maybe what we should do is simply move towards using gas-electric hybrids with a plug-in capacity.

How fast can we change?

If we face a rapid need to restructure the world energy economy, one of the things we have to ask ourselves is: how quickly can we do it? The example I just gave is one of the ways we can move very quickly. Here's another approach: While I was researching *Plan B*, I went back and reread some economic history of World War II. In particular, I read President Roosevelt's State of the Union Address on 6 January 1942, one month after Pearl Harbor. In this address he laid out arms production goals. He said we're going to produce 45,000 tanks, 60,000 planes, 20,000 artillery guns and 6,000,000 tonnes of shipping. No one had ever heard of numbers like this before. But what he and his colleagues in the administration realized was that at that time, the largest concentration of industrial power in the world was in the US automobile industry.

After he gave his address, he called in the leaders of that industry. And he said, because you represent such a large share of our industrial capacity, we're going to depend heavily on you to help us reach these arms production goals. And they said, well, Mr. President, we're going to do everything

we can, but it's going to be a stretch, producing cars and all these arms, too. And he said, you don't understand, we're going to ban the sale of private automobiles in the United States.

That's leadership. And what we actually did was exceed every one of those production goals. From April 1942 until the end of 1944, there were essentially no cars produced in the United States. The whole automobile industry was restructured. Not in decades, or in years, but in months. I use this example because if it becomes urgent for us to do something, and if we have leadership there's no limit to what we can do and how quickly we can restructure the energy economy. I could go through a long list of things we can do, but the point is, we can turn things around quickly if we need to.

The key to making a shift like that is getting the market to tell the ecological truth. We are all economic decision-makers: as consumers, corporate planners, government policy makers, and investment bankers – and we rely on market signals to guide our decisions and our behaviour. But the market is now giving us a lot of misinformation. It's not telling us the truth about prices and about costs. For example, when we buy gasoline we pay the cost of pumping the gasoline out of the ground, refining the gasoline, and delivering the gasoline to the local service station – but we do not count the cost of damage for acid rain, respiratory illnesses from breathing polluted air, and certainly we do not count the devastating cost of climate change.

We have a model now for how to do this. The Centers for Disease Control in Atlanta published a study on the cost to society of smoking cigarettes. Not counting the premature deaths caused by smoking, but just looking at the costs of treating smoking-related illnesses and lost worker productivity, they concluded that the cost to society of smoking a pack of cigarettes is $7.18. Someone bears those costs now, by the way – it may be the worker, the employer, or taxpayers paying the Medicare cost of treating smoking-related illness.

With gasoline, we don't know what the true cost is because we haven't done the research. It's more difficult – we have to deal with climate change projections, for example. When we do find out, I think we will discover that the costs are extraordinarily high. For instance, during this century a rise in sea level of one metre is well within the range of possibility. The World Bank has published a map of Bangladesh showing the effects of such a rise in sea level.

Half of Bangladesh's rice land would be inundated with salt water, and 40,000,000 people would be displaced. We may soon decide that the cost of climate change is unacceptably high, and we may simply not want to leave it for our children to deal with.

To recapitulate: we now have the technologies to drastically reduce carbon emissions, and I recommend cutting carbon emissions in half worldwide by 2015. This is entirely doable, if we decide we want to do it. Let's look at public expenditures, particularly at the US Defense budget. Before the Iraq war, that budget – about $343 billion for military purposes and let's assume $17 billion for state and aid programmes – was $360 billion. If we were to start with a fresh slate and a foreign policy budget of $360 billion a year, how should we allocate it between military purposes and meeting the social goals I talked about earlier of eradicating poverty? Out of what is now a $400 billion budget or more, what if we decided to spend $100 billion for development, instead of the $10-$12 billion it is now? I think our foreign policy interests would be much better served that way, and I think the other industrial societies would support us in those efforts with enthusiasm if we took the lead.

The Earth Policy Institute's web site is www.earthpolicy.org.

Notes

1. Edited text of keynote speech delivered at UNEP's 8th High-level Seminar on Sustainable Consumption and Production.
2. *Plan B: Rescuing a Planet under Stress and a Civilization in Trouble*, W.W. Norton & Co., New York, 2003 (www.earthpolicy.org/Books/PlanB_contents.htm). ◆

Evaluation of river basin management: the Mexican case

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Summary

Institutional arrangements for water resources management at river basin level were first introduced in Mexico as early as the 1940s, with the main objective of fostering water-based socio-economic development. Institutions were again established at river basin level in the 1990s to improve water management practices. Despite these efforts, results have been very limited with respect to efficient and equitable management. Today Mexico's regions are asking for a larger role in planning, managing and decision-making. There are signs that some states have made progress in planning and managing their water resources.

Résumé

Des dispositions institutionnelles pour gérer les ressources en eau au niveau des bassins hydrographiques ont été adoptées pour la première fois au Mexique dès les années 1940, avec pour principal objectif d'encourager le développement socio-économique fondé sur l'eau. Des institutions ont de nouveau été mises en place au niveau des bassins dans les années 1990 pour améliorer les méthodes de gestion de l'eau. Mais ces efforts pour instaurer une gestion efficace et équitable de l'eau ont donné des résultats très limités. Aujourd'hui, les régions mexicaines demandent à jouer un rôle plus important dans la planification, la gestion et le processus décisionnel. Il semblerait que certains Etats aient fait des progrès en matière de planification et de gestion de leurs ressources en eau.

Resumen

México cuenta con disposiciones institucionales para la gestión de recursos hídricos en cuencas hidrográficas desde la década de 1940, orientadas principalmente a promover el desarrollo socioeconómico con base en el agua. En la década de 1990 se volvió a llevar el tema de las cuencas hidrográficas a las instituciones a fin de mejorar las prácticas de gestión de recursos hídricos. A pesar de estos esfuerzos, los resultados han sido insuficientes en lo que respecta a la gestión efectiva y equitativa. Actualmente, las regiones del país demandan una mayor participación en la planificación, la gestión y el proceso de toma de decisiones. Hay indicios de que algunos estados han mejorado la planificación y la gestión de sus recursos hídricos.

Developing countries all over the world have instituted a wide range of environmental and social reforms in the last decades, often in response to international pressures from donor governments, multilateral and bilateral aid agencies and activist NGOs. During the early 1990s, the focus of the portfolio of World Bank loans shifted from infrastructural development, which was prevalent in the 1980s, to anti-poverty and environmental projects. At present, the Bank continues with its agenda on poverty alleviation, stressing the roles of markets, institutions and societies.

The shift in the policies of the World Bank and the regional development banks in the water sector were to some extent a reflection of the popularity of concepts like sustainable development, integrated water resources management and integrated river basin management. Even though these concepts have become popular globally, their operationalization has been very difficult.

Integrated management of water resources has included the formulation of river basin management units as a means to decentralization. River basin authorities have been expected to plan and act in response to specific regional needs, promote the formulation of specific strategies and actions for efficient use of water resources to improve the lifestyles of the local population, and simultaneously protect the environment. River basin authorities have also been expected to consider regional, political, economic, social and environmental issues within the overall context of integrated water resources management (Dourojeanni, 2005).

During the 1950s and 1960s, national policies in some Latin American countries favoured a regional planning approach, with the objective of creating development poles that would ease the pressure on the highly centralized urban and industrial centres. Some countries focused their attention on the river basins as possible management units for water resources development, trying to imitate the achievements of the Tennessee Valley Authority (TVA) in the United States. Later, in the 1990s, the general concept re-emerged, with wider acceptance than before, when the interest in river basin organizations became widespread not only in Latin America but also in many other parts of the world. French and British experience was noted, and authorities at river basin level were established in most Latin American countries.

Several Latin American countries have developed institutional frameworks to manage water resources at the regional level. Bilateral and multilateral commissions have been established in the region, as well as networks such as the Latin American Technical Cooperation Network on Watershed Management, the Latin American Network for Basin Organizations and the Caribbean Network on Upper Watershed Management. In terms of legislation, only Brazil and Mexico have water laws that promote river basins as units for water resources management.

While integrated river basin management has become a popular paradigm in Latin America, an objective analysis will indicate that countries have generally failed to use this concept to increase the efficiency of water management in the region on a sustained basis. Analysis of the Mexican experience will show that implementation of this concept has also not been successful.

River basin commissions

In Mexico in the 20th century, economic and social goals at the national level predetermined what were expected to be the most appropriate policies and institutions to cover the needs of the population and encourage national and local economic growth, taking into consideration the environmental capacities of the country's several regions.

It was towards the end of the 1940s that Mexico embarked on large-scale, water-based integrated development programmes for the arid plains of the north and the tropical areas in the east and southeast. The then administration (1946-1952) focused on water use for areas' integrated development, with the main emphasis on tropical areas. It was felt that the tropics were backward areas where "everything had to be done". There was enormous optimism, in the sense that development of these regions was a real possibility because of the availability of untapped natural resources, mainly water. Water was recognized as an engine to trigger integrated development of different regions, through which the quality of life of the local populations would be improved over both the short and long terms and the economic growth of the country would accelerate.

Specific river basins were selected where agricultural (including agro-industries at the com-

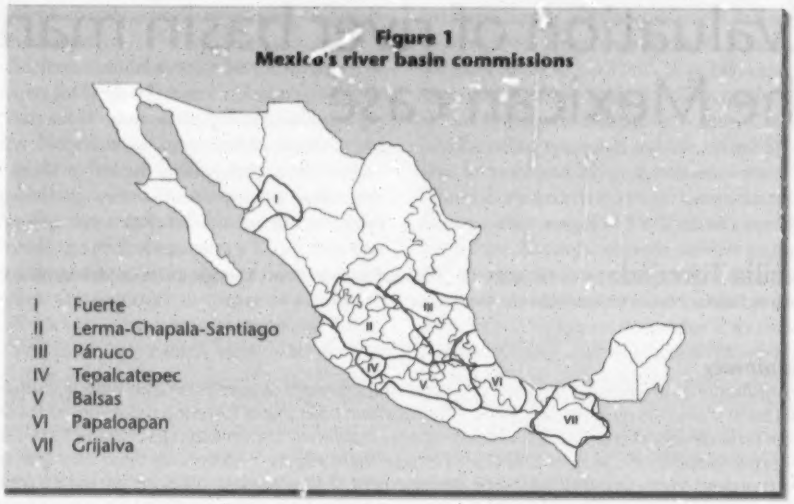
mercial level), forestry and industrial development related activities could be encouraged. A main objective was also to settle the different regions with populations from the central part of the country, where not enough agricultural land was available. People were encouraged to migrate to tropical areas, thus providing the labour necessary for the development of the regions. The river basins selected had plentiful natural resources, but the people lived in extreme poverty, with acute health problems and with inadequate social and support services in the sectors of health, education, communication or transportation.

To implement the water-based development plans, a strong institution responsible for water management at the central level was established, the Ministry of Water Resources. To coordinate the activities that would be carried out in the several basins, the river basin commissions were created as the country's first semi-autonomous, multi-purpose implementing agencies. Both implementing and planning agencies were created at the river basin level. The executing agencies included the Papaloapan and the Tepalcatepec River Basin Commissions (1947), the Fuerte River Basin Commission (1951) and the Grijalva River Basin Commission (1952). To include larger areas within the integrated development programmes, the Tepalcatepec Commission was wound up in 1960 and the Balsas River Basin Commission, which covered a much larger area, was created the same year. Under the leadership of the Ministry of Water Resources, the following ministries participated in the development of the river basins: Ministry of the Interior, Ministry of Finance and Public Credit, Naval Ministry, Ministry of Economic Issues, Ministry of Agriculture and Livestock, Ministry of Communications and Public Works, Ministry of Health, and Ministry of National Properties and Administrative Control.

In general, the tasks of the implementing commissions included, but were not limited to, planning, design, coordination and construction of irrigation projects, flood control programmes and hydropower generation. The commissions were also responsible for expenditure on urban and rural development and health and communication services (including navigation, ports, roads, trains, telegraph, telephone services, etc.). Planning agencies included the Lerma-Chapala-Santiago and the Pánuco Commissions (**Figure 1**).

When the river basin commissions were established, the prevailing policy emphasized the importance of integrated social and economic development of the regions based on the natural resources available, water being the main resource. The commissions had full authority to plan and execute programmes for integrated development under their direct supervision. They were also responsible for coordinating the activities of the several ministries within the river basin, for which they had limited authority but on which they were able to make inputs. Because the river basins included more than one state, the commissions were more powerful than the states and municipalities. Thus, even though the river basin commissions had the authority to plan and implement the different tasks in coordination with the specific ministries, the fact that the commissions were above the states created tensions among the institutions over the years.

Figure 1
Mexico's river basin commissions



When the commissions were first established, they had full support from the Mexican president and were practically autonomous, with almost no budgetary limitations. However, this situation changed with time. Subsequent administrations had their own views as to what should be the roles, if any, of the river basin commissions within the overall economic development strategy of the country.

It should be noted that the performance of the different river basin commissions varied according to the socio-economic and political conditions of Mexico at specific times. These conditions depended, and still depend, on each six-year presidential mandate, and hence on the priorities and budgetary allocations of each administration. For example, in 1947 the central government considered that water resources in the several geographical areas could act as "engines" for development of the poorest regions of the country. Accordingly, it provided very significant financial support to the Ministry of Water Resources for the implementation of projects. However, subsequent administrations had different approaches, which were reflected in the activities authorized for the commissions and the budgets allocated. The achievements of the commissions were not always of their own making, since they depended mostly on decisions at the federal level on which they had limited or no control.

Performance of the river basin commissions

To understand the water-based integrated and regional development programmes and institutional arrangements, it is necessary to analyze the forces that provided the context for these programmes and institutions. It is important to note that water and agricultural policies have been intertwined for decades as part of the country's economic development strategies. Hence, any change in the water policies affected agricultural policies and vice versa.

In 1947, when the river basin commissions were established, the economic policies of the country focused primarily upon large-scale agricultural and industrial development projects. Numerous large projects were constructed for different purposes, the most important of which were for irrigation and hydropower generation. Investment in irrigated agriculture was extensive. From 1947 to 1967, irrigated area increased by more than 1.2 million hectares. The expectation was that expansion of irrigated agriculture would bring agro-industrial development, increase exports and generate new employment opportunities.

However, a major constraint on policy implementation for all sectors, including those in water and agriculture, was that programmes and projects at both national and local levels had to be planned and implemented only within the six-year presidential administrations, which was not possible. Historically, with the election of a new president, even though he was from the same political party as his predecessors, the new administration invariably made radical changes in national priorities, policies and programmes. This has meant that the continuity of major development programmes and projects could seldom be assured beyond the six-year presidential term.

For example, the national policies during the 1946-52 presidential term were to invest heavily in the different regions, more with economic than social objectives. The administration that followed in 1952-58 faced high inflation rates and currency devaluations. Consequently, the total budgets of the different ministries, including the river basin commissions, were reduced in real terms. However, since there were large development projects under construction (mainly for irrigation and hydropower generation), the Ministry of Water Resources was still given some priority. Afterwards, support to the river basin commissions continued but the projects implemented became fewer. More importantly, the power and authority of the commissions were steadily reduced. The political perception was that the commissions clashed with the other ministries and with the state governments.

At the beginning of the 1960s, national exports declined, investment plans for the public sector

were changed, and the budget allocated to the agricultural sector was drastically reduced, impacting negatively on the performance of the river basin commissions. From 1964, the water policies of the country emphasized not so much the construction of water projects but the improvement and development of small irrigation projects, primarily because the objective was to increase social benefits. For water resources planning, several regions were established and water plans were formulated for the northwest, central and central-Gulf regions.

Later, in 1976, due to the importance of irrigation at the national level, the Ministry of Agriculture and Livestock and the Ministry of Water Resources were combined to from the Ministry of Agriculture and Water Resources. This new institutional arrangement, under which water planning, management and development activities were placed under different ministries, made coordination and execution of any water policy very difficult.

By 1982, water scarcity and water pollution had become serious problems at the national level. The new administration (1982-1988) prepared a new water policy by considering these constraints. Among the other problems it addressed were flood control, conflicts between water uses and users, and low efficiency of water use in all the sectors. While the need for construction of infrastructure was acknowledged, the main objectives were appropriate use of water, maintenance of all types of infrastructure, water pollution abatement through better administration of water resources, improved social and economic efficiency, technological improvements, and human resources development.

In an effort to decentralize, the Ministry of Agriculture and Water Resources delegated activities to its offices in the states and established regional coordinating agencies to improve the integrated management of water at the river basin level. Since the new water policy emphasized the management of water resources at the regional level, it was decided that the offices of the Ministry at the state level would take over the responsibilities of the river basin commissions, including further planning, management and development of water resources, and that the river basin commissions should disappear. It was decided that plans for the use of water resources, developed by the authorities at the municipal, state and federal levels, would be based on the hydrologic basin, but taking into consideration the development trends in each region.

During the years the commissions acted as executing agencies, they made determined attempts to develop the several basins and regions. However, while the activities carried out by the river basin commissions had beneficial impacts on the overall development of the country, their programmes and projects did not achieve their objectives at the regional levels. This is because an increase in irrigated area did not necessarily increase agricultural production and thus improve the quality of life of the local populations. Investment in social issues, and provision of credit and technical assistance, are equally important factors to ensure the long-term success of any agricultural development project.

An important issue during the period in which the commissions were functional, as well as at present, is that the river basin commissions, being semi-autonomous institutions, were coordinating entities for the national funds at the regional level. The commissions were active in several states, where they were able to coordinate the efforts of the several ministries to improve the social conditions of the regions. This task was especially challenging since it depended on the political will of the parties and required considerable commitments from all the parties, which was, and continues to be, a most difficult task.

Concluding remarks

The overall objective of the river basin commissions was to promote economic and social growth in the appropriate regions, which was expected to reduce prevailing inequalities among and within the regions. Initially, this was expected to be achieved through infrastructural development and settlement programmes, which in turn were supposed to trigger agricultural development, hydropower generation, industrial investment, employment generation and higher incomes for the local populations.

Establishment of the river basin commissions was a national effort to use water to develop the regions. While the programmes implemented by the commissions may have had some beneficial impacts on the country's overall development, they basically seem to have failed to reduce regional inequalities and alleviate poverty. Decision-making failed to realize that an increase in irrigated area *per se* was not sufficient to alleviate poverty and improve the quality of life of the local people. Important issues like investments in social services, provision of credit, technical assistance, participation of stakeholders and capacity building were not adequately considered, even though they are absolutely essential to ensure the long-term success of any development project.

In terms of the performance of the existing institutions for river basin management so far, it has to be concluded that they have basically not achieved efficient management of water resources at the basin level. At best, they have had minor impacts in improving water management practices, which means that fundamental institutional realignments are necessary if the present basin councils are to become successful organizations to manage water regionally.

Regrettably, no comprehensive and objective evaluations have been made of the viability of such institutions, the extent to which they have fulfilled their objectives and their overall societal impacts, both positive and negative. The absence of such assessments has meant that appropriate lessons have not been learned from their failures, and/or sub-optimal performance, and hence practices have not improved.

While demand for water for various uses has increased significantly in Mexico in recent decades, management practices and capacities have improved only slowly and incrementally. Consequently, the country's water problems, in terms of quantity, quality and management, have become more serious and complex than ever before in history. Demand from different uses and users is increasing rapidly, but the technical and managerial expertise and financial resources of the concerned institutions are growing only incrementally. Unless these trends are reversed, the water situation of the country is unlikely to get better in the foreseeable future. Not surprisingly, the OECD (2004) has concluded that "water use in Mexico is on an unsustainable path."

Furthermore, in spite of efforts at decentralization, the real authority to plan and manage water resources continues to be vested in one single institution at the central level, which has been unable thus far to respond successfully and sensitively to the escalating needs of the sector and of the different regions of the country. For all practical purposes, it has been unwilling to decentralize appropriate decision-making powers, investment funds and technical and managerial resources.

Fortunately, however, the country as a whole is changing. The regions are asking for a greater role in planning, managing and decision-making, not only in the area of water but in other sectors as well. There are positive and encouraging indications that some states are making good and commendable progress in planning and managing their water resources. States are realizing that water is an important resource, and that its timely and proper development and management would affect the lives of the people and their quality of life in various ways.

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PuR: a low-cost water treatment product for disaster response and for in-home use in the developing world

In June the Procter & Gamble Company (P&G) was one of the winners of the International Chamber of Commerce (ICC) World Business Award in support of the Millennium Development Goals. This is the first worldwide business award to recognize the significant role business can play in reducing poverty around the world by 2015. P&G received the award for its low-cost, simple-to-use water purification technology, "PuR Purifier of Water".

Winners were selected by a panel drawn from business, labour, research and academic bodies, environmental groups and the United Nations. The awards were presented in Marrakech, Morocco, by the ICC in association with the UN Development Programme (UNDP) and The Prince of Wales International Business Leaders Forum (IBLF).

In Haiti, diarrhoea is the leading cause of death among children aged one to 11 months and the second leading cause among those aged 12-59 months

PuR was developed in cooperation with the United States Centers for Disease Control (CDC). It visually clarifies treated water and reduces pathogenic bacteria, viruses and parasites, resulting in drinking water that meets World Health Organization (WHO) guidelines. P&G reports that point-of-use water treatment approaches like PuR have shown reductions of 30-50% in diarrhoeal disease, with even higher reductions during water-borne epidemics. The product's retail cost is about US$ .01 per litre of treated water.

PuR is used in emergency and disaster response where there is an immediate need for safe water. P&G has provided it to AmeriCaires, the Red Cross, the International Rescue Committee, UNICEF and other international relief organizations to purify hundreds of millions of litres of water in Bangladesh, Chad, Haiti, Iran, Liberia, Malawi, the Sudan, Zimbabwe and other countries.

This product also has potential for long-term, in-home use in developing countries. Development and testing took place in the Philippines, Guatemala, Morocco and Pakistan. P&G recently licensed distribution of PuR to an NGO, Population Services International (PSI), to reach consumers in Haiti and Uganda. The partnership also includes USAID, the Johns Hopkins Bloomberg School of Public Health and CARE.

Speaking at the 8th International High-Level Seminar in Monterrey, George Carpenter, P&G's Director of Corporate Sustainable Development, explained that the chemicals in the PuR kit are the same as those currently used in municipal water systems: "We just reverse engineered municipal water treatment, and put it in a sachet that treats 10 litres at a time in the home."

When the powder in the PuR sachet is mixed with water, pathogens are removed and particles settle to the bottom of the mixing container. Consumers just follow these simple steps: add a sachet to 10 litres of water; stir for five minutes until clear; filter the water through a clean cotton cloth and dispose of the floc; and let the clear water stand for 20 minutes to allow complete disinfection. To prevent recontamination, the water should then be stored in a suitable container.

Mr. Carpenter emphasized that for his company PuR is not an example of "business as usual". It is one of several P&G initiatives to develop products and technologies that improve the quality of life of people in the developing world. Other initiatives address micronutrient deficiency in children's diets and how to reduce the amount of water and time required to hand-wash clothes.

For more information about PuR Purifier of Water, see: www.pghsi.com/communications/pur.htm. For the ICC-UNDP-IBLF World Business Awards in support of the Millennium Development Goals, see: www.iccwbo.org/awards.

Sustainable consumption and production and the energy sector[1]

Summary

How can developing countries acquire badly needed modern energy services without damaging human health and the environment within their own borders and beyond? Will they be able to profit from lessons learned in developed countries? How can energy efficiency be increased in the developing and developed world at the rate required? How can pollution – which, it is now recognized, "does not respect national borders" – continue to be reduced? These are some of the issues addressed at Monterrey, in the context of sustainable development and energy. International initiatives, including those in which UNEP is involved, are described.

Résumé

Comment les pays en développement peuvent-ils acquérir les services énergétiques modernes dont ils ont cruellement besoin sans nuire à la santé et à l'environnement à l'intérieur de leurs frontières et au-delà ? Sauront-ils tirer parti des leçons tirées dans les pays développés ? Comment améliorer l'efficacité énergétique dans les pays en développement et les pays développés au rythme souhaité ? Comment peut-on réduire encore la pollution, dont on admet maintenant qu'elle « ne respecte pas les frontières nationales » ? Ce sont quelques-uns des problèmes abordés à Monterrey dans le contexte du développement durable et des services énergétiques. L'article présente plusieurs initiatives internationales dans ce sens, notamment celles auxquelles est associé le PNUE.

Resumen

¿Cómo pueden los países en desarrollo adquirir los servicios de energía modernos que tanto necesitan sin dañar la salud humana ni el medio ambiente dentro y fuera de sus fronteras? ¿Podrán beneficiarse de las experiencias de los países desarrollados? ¿Cómo puede incrementarse la eficacia energética en el mundo desarrollado y en el mundo en desarrollo al ritmo necesario? ¿Cómo puede seguir reduciéndose la contaminación (que, ahora se reconoce, "no respeta fronteras")? Éstas son algunas de las preguntas planteadas en Monterrey en el contexto del desarrollo sostenible y la energía. El artículo describe diversas iniciativas internacionales, incluidas aquéllas en las que participa el PNUMA.

Sustainable energy systems are poised to meet growing energy demands, while simultaneously addressing:

- energy poverty in developing countries;
- energy security in developed countries;
- environmental improvement in all regions.

Alternative energy sources such as wind power, solar photovoltaic and biogas – as well as and energy efficiency – are mature energy options with a variety of applications. Other sustainable energy technologies continue to evolve rapidly. The wind energy and solar photovoltaic industries are both growing by more than 30% per year, with combined annual revenues exceeding $10 billion.[2]

Trillions of dollars will be invested worldwide in the next two decades to develop and upgrade global energy systems, with nearly $1 trillion per year required in developing countries. However, investments in sustainable energy are still a small fraction of total investment in an energy sector that continues to rely on heavily polluting fossil fuels.

Energy, health and the environment

The creation of energy systems to power sustainable development is intimately linked to health and environmental issues, expecially in the case of combustion of fossil fuels and of biomass used as fuel. In addition to the misery and suffering associated with health effects, they damage the economy, costing billions of dollars in direct costs and lost productivity.

While the largest share of greenhouse gas (GHG) emissions comes from developed countries, the contribution from developing countries will grow significantly if new investments in energy infrastructure follow the "business as usual" fossil fuel path. It is also increasingly clear that impacts from climate change will be disproportionately borne by developing countries, particularly the poorest citizens of those countries.

Energy and economic growth

Energy is an essential component of economic growth, transforming materials and labour into useful goods and services. There is a strong relationship between the quantity of energy used by a country and the size of its economy. However, this relationship is not necessarily linear – with the right policies encouraging energy efficiency, economies may be able to "delink" the amount of energy used to produce a unit of gross domestic product (GDP). Further, it is not energy *per se* that is needed, but what the energy provides – e.g. cooked food, chilled vaccines and transport of people and goods.

Even if energy production and use had no environmental impacts, it would be a basic sustainable development policy issue on economic grounds alone. Access to energy is not an explicit UN Millennium Development Goal, but energy is directly linked to efforts to provide clean water, improved health care and education. Energy is a necessary input to development. As a key driver of economic growth and a source of environmental stress, energy is a complex element of sustainable development policies, which must optimize economic returns from increased energy use while eliminating environmental damage.

China has shown that it is possible to achieve economic growth without a corresponding jump in GHG emissions. Its CO_2 emissions fell by 6-14% between 1996 and 1999, while its economy grew by 22-27%. By contrast, CO_2 emissions in the United States during the same period increased by approximately 5% in a growing economy.[3]

Because poor developing countries have little energy infrastructure in place, they have an excellent opportunity to choose cleaner – and sustainable – alternatives. New investments in sustainable energy technologies can couple further economic development with environmental improvements at the local and regional level and help meet the global goal of reducing GHG emissions.

Energy and society

Connections between energy and sustainable development become more complex and compelling when social aspects are also considered. The availability of energy resources can determine how much food is grown and cooked, how living space is heated or cooled, and how much time is needed to obtain the energy used by a family or home (and, consequently, how much time is left over to generate income).

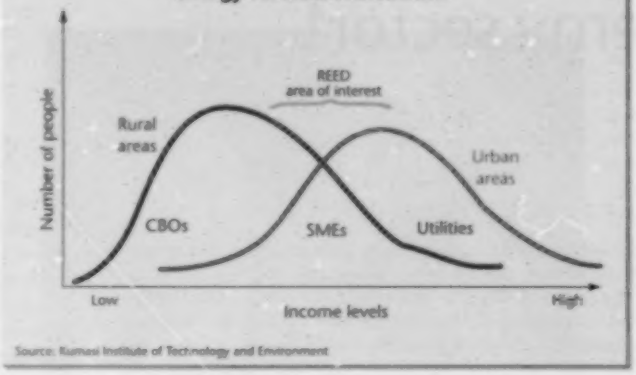
Developing countries, particularly the poorest, consume far less energy than developed ones. When we consider the effects that limited energy choices have on the world's poorest households, it is clear that adequate energy resources need to be available at the local level to support the social "pillar" of sustainable development.

The *quality* of energy matters as much as its *quantity*. Solid, liquid and gaseous fuels vary in their ability to provide an energy *service*. Depending on application and point of use, coal can be a higher quality energy resource than wood; oil a higher quality one than coal; and electricity a higher quality one than solid, liquid or gaseous

fuels. Poorer countries not only use smaller amounts of energy, they also tend to rely on lower quality fuels such as animal/agricultural wastes and fuelwood. Relying on these low quality fuels limits the choice of energy services, while contributing to damage to human health and the environment.

Just as the social dimension of sustainable development forces policymakers to look beyond total development performance, it also demands that we look beyond total *energy* performance and availability. The human development focus imposed by the social dimension of sustainable development requires us to look at the distribution of resources and opportunities across society, particularly with respect to the poorest people in the world, who live on less than one US dollar per day.

Figure 1
Energy services framework



Source: Rismoi Institute of Technology and Environment

Key issues and challenges

Several key issues and challenges can be identified regarding the supply of energy for sustainble development. These include:

- expanding access to modern forms of energy services in developing countries;
- improving energy efficiency across all sectors of the economy;
- increasing the use of renewable energy sources;
- improving energy policies to account for environmental and social impacts.

Underlying these issues and challenges is the need to direct (or redirect) finance towards investments in cleaner and more efficient energy technologies and infrastructure. Two principal issues addressed here are *improving access to modern, sustainable forms of energy* (in short, "energy access") and *increasing energy efficiency.*

Energy access

The richest people in the world use nearly 25 times as much energy per person as the poorest – a global disparity that is, in itself, clearly unsustainable. Further, nearly one-third of the people in the world have no access to electricity and another one-third have only unreliable or intermittent access. These people mainly rely on traditional fuels for basic cooking and heating.

In Sub-Saharan Africa, only one in ten persons has access to electricity and an estimated 40% live in areas where extraction of biomass has exceeded the sustainable yield. In this vast region, however, the potential also exists to modernize and expand the energy sector through new renewable energy and energy efficiency projects, even if in most countries this is not happening. In Cameroon, for example, the energy supply remains very traditional despite the fact that it is one of the sub-region's most diversified economies,[4] with wood and charcoal still the main cooking fuels. Electricity production is inadequate because of outdated equipment, a situation aggravated by poor rainfall to feed the country's hydroelectricity-producing dams.

Rural women and children are most affected by "energy poverty", as they spend increasing amounts of time collecting firewood and other forms of biomass. They are also most exposed to indoor pollution when this biomass is burned for cooking and heating. The World Health Organization estimates that such indoor pollution has become the world's fourth largest health risk.

Rural development depends on improving access to better energy services, including a mix of:

- extension of electricity grids;
- deployment of decentralized energy systems, based on conventional and renewable sources;
- promotion of local energy entrepreneurs and small businesses;
- establishment of financial mechanisms to improve access in rural and peri-urban settings;
- strengthening policies and regulatory systems that support better access to modern energy services based on clean, sustainable energy.

This challenge requires a concerted effort by all stakeholders – from international organizations and national governments to the private sector and individuals. Because energy systems can take decades to create or change, action must be taken now.

Creating new investments is a difficult financial and political challenge for governments, which must often place the needs of urban concentrations (those with growing populations of poor migrants are also challenged to supply modern energy services) ahead of rural areas. One of the best ways to overcome this barrier – and expand access to sustainable energy services – is to involve new actors in the private sector.

The centrally planned utility model is very often limited in its ability to deliver modern energy services that fully meet the needs of unserved or underserved populations. Energy sector reforms have helped some state utilities improve their operations, but such reforms are often too supply-side oriented and too focused on urban demand.[5] In theory, liberalization has opened new markets to the private sector. However, few investments in new capacity have been made, apart from the privatization of many formerly state-owned utilities.[6]

Rural areas, in particular, have mostly been ignored by private investors and have received very little or no benefit from the opening of markets. Significant efforts have been made to improve the traditional energy supply system, with much work focused on improved technologies (e.g. cook stoves) and non-commercial delivery channels (e.g. community-based organizations). However, little work to date has been focused on the role and potential of small and medium-sized enterprises to deliver modern sustainable energy products and services (**Figure 1**).

Sustainable energy SMEs will never displace the need for centralized utilities that are generally well adapted to supply urban agglomerations and industrial areas. But there are many areas where independent sustainable energy enterprises can better and more efficiently package small-scale energy technologies and services for rural and peri-urban populations. Efficient cook stoves and compact fluorescent lighting, bioenergy systems, industrial waste-to-energy projects and small-hydro mini-grids are possible local sustainable energy enterprises that could provide well adapted solutions that ideally complement the commercial and technological strengths and limitations of large utilities.

Moreover, the scale of the energy access challenge and the amount of public assistance needed, mean that current official development assistance (ODA) and public sector spending are not sufficient. Mobilizing ODA and public domestic resources to lever private funds for energy and development is critical for improving the access and quality of energy services in developing countries. International cooperation and consul-

> In Central America, it is projected that at least 50% of growth in generation capacity could be supplied by renewable energy resources – about 2750 MW of renewable energy in the next ten years or 300-350 MW annually. However despite the high potential of renewable energy, most recent capacity additions have been based on fossil fuelled generation technologies relying on imported fossil fuels.

tation are also important to improve coordination of ODA while taking a country's needs, priorities and strategies into account. In addition, new methods of public-private cooperation within a sound framework of policies and regulations may help attract private capital. There is currently no global forum to facilitate this kind of transparent and inclusive dialogue.

Energy efficiency

There is a huge untapped potential for improving energy efficiency in almost all energy applications, sectors and services. At the end-use level, energy efficiency can dramatically reduce energy use in equipment such as heaters, air conditioners, appliances, lights and motors. The newest LED lights, for example, are up to 80% more efficient that conventional electric bulbs. Improving energy efficiency is often highly profitable, but barriers remain. These include:

- inadequate information, technical knowledge, and training;
- uncertainties about the performance of new energy-efficient technologies;
- inadequate capital or finance;
- the higher initial and perceived costs of more efficient technologies;
- higher transaction costs, such as training and searching/assessing information;
- inadequate incentives for maintenance;
- split incentives for the user relative to the investor (e.g. when energy bills are paid by the renter, the property owner may have no incentive to invest in more efficient technology);
- enegy prices that do not include the cost of pollution and environmental damage;
- patterns and habits of consumers, operators, and decision-makers, which may be influenced by many factors;
- the lack of R&D investments to improve energy efficiency.

By reducing energy use, energy efficiency can also reduce the negative impacts of conventional energy options while stimulating new industries in energy efficient goods and services. Morevoer, energy efficiency is a *dynamic* process in which one set of improvements can lead to a range of further improvements in the manufacturing and use of the product.[7] By increasing the efficiency of a motor, for example, the waste heat can be reduced, which reduces the need for equipment to cool the motor, which can reduce materials and weight.

Using energy more efficiently is especially important in countries with limited energy resources (particularly electricity generation and distribution capacity) and where energy efficiency standards, energy labelling, demand-side management and standards for building and construction can all dramatically improve and extend exisiting energy capacity.

The path forward

In our increasingly globalized world, measures to improve energy access and energy efficiency can be implemented more effectively through international and regional cooperation. There is considerable scope for North-South cooperation, as well as South-South exchanges of experiences and successes, particularly with new and evolving technologies and systems. Thus international cooperation, and global goals and targets, can be a useful guide when a country sets national priorities.

UNEP is working on several fronts to improve energy access and increase energy efficiency. Its Rural Energy Enterprise Development (REED[8]) initiative, in cooperation with the public purpose investment company E+Co, operates programmes in five African countries (AREED[9]), in Brazil (B-REED[10]) and in China (CREED[11]). The REED approach, which offers "clean energy" entrepreneurs a combination of enterprise development services and start-up financing, is based on the recognition that one of the most potent engines to produce and distribute modern energy services in developing countries is an enterprise, powered by an entrepreneur. Each of the REED programmes encourages sustainable energy enterprises that use clean, efficient and renewable energy technologies to meet the energy needs of underserved populations, thereby reducing the health and environmental consequences of energy use.

> "Sustainable consumption for all. That is UNEP's ambition."
>
> **Klaus Toepfer, UNEP Executive Director**

UNEP also promotes other finance initiatives to stimulate markets for sustainable energy. The Indian Solar Loan Programme, for example, helps banks in Southern India offer affordable consumer loans for solar home systems. In the first 18 months of the Programme, more than 10,000 loans have been extended and the Programme is on track to help 23,000 Indian households acquire clean, renewable solar electricity. Many of UNEP's finance initiatives are now promoted through the Sustainable Energy Finance Initiative or SEFI.

The basis of the global mandate to change unsustainable patterns of consumption and production is the requirement that we all – government, industry and civil society – change how we do business. UNEP's approach is project-based. It involves working with donors and other partners to design and develop demonstration projects and test models, and to develop supporting tools and methodologies on the ground. These, in turn, will be replicated elsewhere to support new forms of development that "leap" over the traditional, resource-intensive models of the current development agenda.

UNEP also supports the development of training materials in conjunction with groups such as the German organization InWEnt, the International Chamber of Commerce and the International Federation of Consulting Engineers. This work and other activities to build the capacity of professional organizations in developing countries are undertaken through the UNEP/UNIDO Network of National Cleaner Production Centers (NCPCs).

These centres are actively engaged promoting energy efficiency through UNEP's Energy Management and Performance Related Energy Savings Scheme (EMPRESS), which supports energy efficiency efforts in Eastern and Central Europe. Another project, "Promoting Industrial Energy Efficiency through a Cleaner Production / Environmental Management System Framework" (CP-EE Project), is designed to reduce the emission of greenhouse gases by identifying and carrying out energy efficiency (EE) improvements as an integral part of Cleaner Production (CP) assessments in industrial enterprises in China, Vietnam, India, Hungary, the Czech Republic and Slovakia.

In addition to these efforts by UNEP and many other UN bodies, new initiatives are needed to improve international cooperation and mobilize energy investments that contribute to sustainable development. As part of such efforts, concrete actions are needed to build effective public-private partnerships and strengthen the capacity of developing countries to develop and implement energy policies and programmes that support sustainable development. Much of what needs to be done can best be achieved through partnerships that improve overall economic efficiency while producing environmental benefits at the global and national levels.

There is also a need for appropriate mechanisms to foster increased cooperation among organizations and institutions. The transfer of technology between countries and within them, for example, is an important part of the global response to foster sustainable development.

To achieve tangible progress in all these areas, governments and the private sector can:

- provide information on the critical role energy plays in sustainable development;
- integrate national energy policies with the economic, social and environmental goals of sustainable development;
- ensure equitable access to energy services, particularly for the poor;
- accelerate rural energy development, including electrification of rural areas through grid extensions and decentralized renewable energy options;
- create market-based policies and regulations;
- diversify energy sources to increase energy security by developing local energy resources;
- improve access to environmentally sound energy production and conversion technologies.

At the regional and international levels, actions are needed to:

- strengthen regional and international cooperation to secure energy supplies and stabilize energy markets;
- expand energy efficiency, renewable energy and advanced fossil fuel technologies and standards;
- build institutional and human resources;
- mobilize financial resources to support national efforts;
- improve access to technical and policy information;
- promote participation by all relevant stakeholders.

Turning it on

It is not difficult to ignore many of the issues presented here. In the wake of major international disasters, attention naturally narrows to the immediate. Longer-term issues and actions may seem, at the time, a luxury that is unaffordable.

Sustainable development, however, is as much an attitude as it is an action. When woven into the fabric of everyday life, this attitude brings change in unpredictable ways – even to immediate emergencies.

Sustainable energy development in the early 21st century is still in many ways a horse without a rider, and very much "business *unusual*". At its very core, the energy for sustainable development is the kilojoules to cook food, make clothes and build houses that do not leave a toxic legacy to the children and grandchildren of the Earth's current families.

Sufficient mandates for action exist – the most recent being the Plan of Implementation from the World Summit for Sustainable Development and the Millennium Development Goals. Although governments, business and civil society are committed to making the changes needed for sustainable development, the immediate challenge is to accelerate these measures. Delay only puts people's lives at risk, as well as the health of the planet's natural values and the global economy.

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US states in the lead: creative public finance of clean energy

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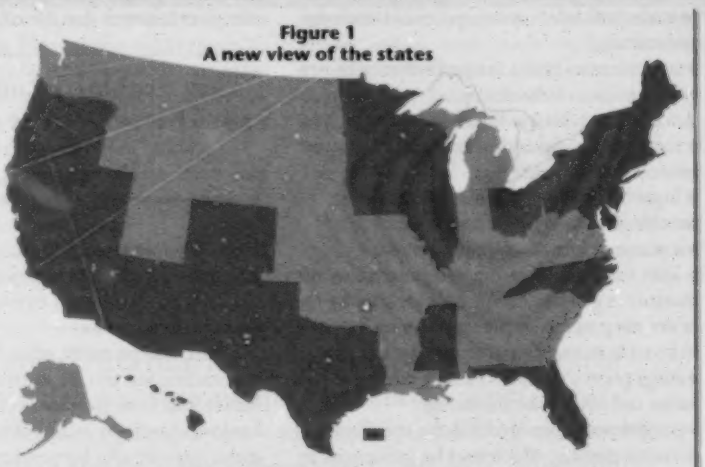
These days it is common to look at US states along typical political lines: "red" for Republican and "blue" for Democratic. Given the current political landscape, it is not surprising that the prevailing perception of US policies on climate change and renewables is one of inaction.

However, the states have always been the historical locus for technology innovation in the US. As a result of electric utility restructuring, state clean energy funds will have nearly US$ 4 billion to invest in clean energy activities over the next decade. This is one of the single largest sources of new funding for clean energy in the US.

When you take a new view of the states – one that includes support for state clean energy funds, fuel cell and hydrogen programmes, renewable portfolio standards (RPS) and carbon trading, 27 states (70% of the US population) are supportive of strategies and actions to increase investment in clean energy (**Figure 1**).

The past several years have witnessed an explosion of nonpartisan state leadership on clean energy investment. States are following the historical trend of a "federalist" approach where, by acting both individually and collectively with other states and countries, they are leading the way towards a low-carbon economy by developing new funds and investment vehicles for clean energy.

Figure 1
A new view of the states



Added all together, state funds + fuel cell/H² programmes + RPS + carbon trading = over 200 million people in 27 states (70% of the US population)

Source: Clean Energy Group 2004

The CESA

Clean Energy Group[1] serves as the non-profit manager for the Clean Energy States Alliance, or CESA, a 15-state coalition of public clean energy funds in the US working together to develop and promote clean energy technologies, and to create and expand the markets for these technologies. CESA provides information and technical services to these funds and serves to coordinate their common goals.[2]

The state leaders who founded CESA believe clean energy is more than just a means to improve the environment; creating markets for clean energy technologies is essentially a powerful economic development tool. These leaders also understand that establishing wide-ranging regional, national and international networks can transform innovative technologies into sustainable businesses.

Part of CEG's mission is to disseminate the success stories of these clean energy funds to document early experiences and emerging practices in public investment and technology innovation. In conjunction with the Lawrence Berkeley National Laboratories, CEG publishes a series of case studies to report on developments with the funds and share "lessons learned".[3]

In brief, state clean energy fund investment activities extend well beyond R&D technology creation. Some funds provide investments that target specific companies and projects, consumer incentives intended to stimulate demand and general education and market support (**Figure 2**). Together, these activities are helping to fill the gaps in the critical pre-commercial and early commercialization stages.

State collaboration

Through CESA, the individual state funds come together to collaborate on joint initiatives in several areas. Current CESA state-to-state collaborative projects include:

- Clean Energy and Security
- Public Education
- Public Fuel Cell Alliance
- Solar PV
- Investor Outreach
- Public Bond Financing
- RECs and Long-Term Contracts
- Wind Project Siting
- Case Studies.

CEG and CESA projects under development include:

- Climate Change and State Funds
- Offshore Energy Projects
- Community Development Links to Clean Energy Funds
- Clean Energy Pension Investors Network.

Notes

1. Based on the background paper presented at SCP 8.
2. Dollars are US dollars.
3. National Resources Defense Council (NRDC) (www.nrdc.org/globalWarming/achinagg.asp).
4. Cameroon has experienced real GDP growth averaging 4.5% annually over the last six years.
5. Electricity supply in Cameroon does not meet demand. Power cuts are common, particularly during droughts. Despite the privatization of the power utility (SONEL) and the existence of a legal and regulatory framework liberalizing and introducing competition, the supply of electricity and the quality of service to the public in general still exhibit huge shortcomings.
6. In the Central American region, the power sector investment situation varies widely. In spite of some recent examples of successful private sector projects, and some new support programmes for clean energy investment, it is still extremely difficult for small-scale entrepreneurs in the sustainable energy sector to access adequate financing within local financial markets. Challenges are mainly related to prohibitive transaction costs and a distinct mismatch between the needs of the projects and the conventional financial sector products (e.g. term of loans and collateral requirements).
7. See www.naturalcapitalism.org.
8. See www.uneptie.org/energy/projects/REED.
9. See www.areed.org.
10. See www.b-reed.org.
11. See www.c-reed.org. ◆

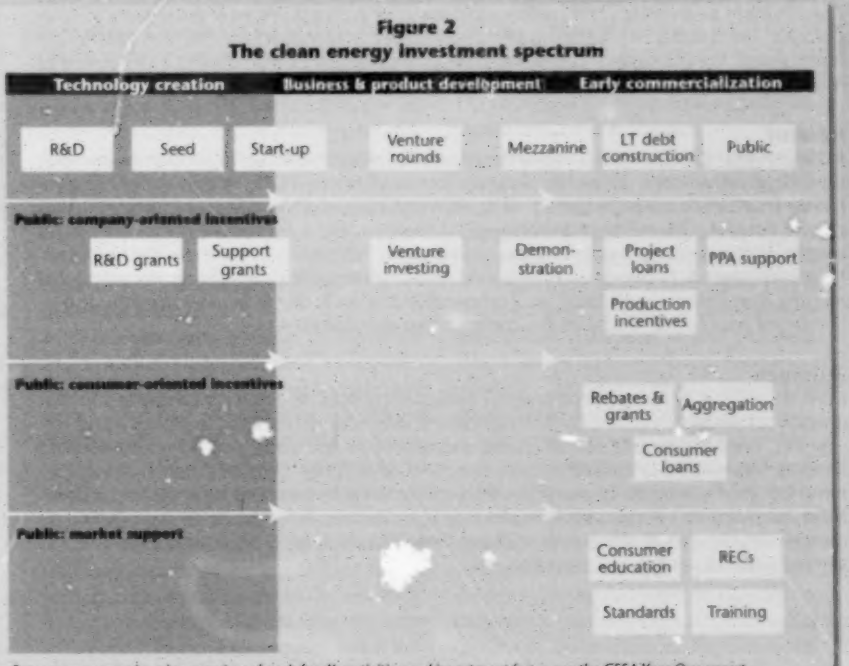
International collaboration

The US state clean energy funds are becoming increasingly involved in activities with their international counterparts, such as the UK Carbon Trust and the German states of North Rhine-Westphalia and Schleswig-Holstein. A delegation of eight state funds participated in the International Conference on Renewable Energy, "Renewables 2004", in Bonn, Germany, in June 2004. This was one of the first times the state funds had played a vocal and visible role on the international stage specifically to promote increased deployment and commercialization of renewable energy technologies and new funding mechanisms to support increased investment in clean energy.

The state funds will be involved in the Renewable Energy Global Policy Network (REGPN) going forward from Bonn. They are eager to explore new opportunities for joint investment on an international basis. To this end, CEG is working with the Carbon Trust on a Transatlantic Low Carbon Development Fund concept proposal to gauge market interest and feasibility.

In addition, Clean Energy Group is working with UNEP and the Basel Agency for Sustainable Energy (BASE) on a new publication, *Clean Energy Investment Options for the Public Finance Sector: A Study of Innovative Mechanisms and Strategies*. The publication will provide an insight into public finance investment programmes that exist today in the clean energy sector, with a focus on selected innovative financial mechanisms and strategies employed by public investors in a range of countries (the US, Canada, Europe, Japan, South Korea and Australia). It will be published in mid 2005.

Figure 2
The clean energy investment spectrum



For a more comprehensive overview of each fund's activities and investment focus, see the CESA Year One report (www.cleanenergystates.org/library/Reports/CESA%20Year%20One%20Report%20Final.pdf).

Source: Clean Energy Group 2004

Moving forward

While most of the state funds' investment activities are geared for developed country markets, these emerging models also hold promise in the long term for developing countries as they, too, build clean energy markets. The early successes of the states' bottoms-up approaches bode well for increased use of creative and innovative finance mechanisms for clean energy. The states have proved their willingness to lead – to establish new funding streams, bridge public and private capital, and shift the paradigm from R&D toward commercialization.

Perhaps most importantly, they have recognized the importance of clean energy investment as a powerful economic development tool, and the necessity of using collaborative networks to further leverage investments made by individual programmes. They extend an open invitation to other states, regions and countries to join them in this approach.

This article is based on a presentation given by Lewis Milford at the 8th International High-level Seminar.

Notes

1. Clean Energy Group (CEG) is a non-profit organization established in January 1998 to increase the use of cleaner energy technologies in the United States and abroad through creative financing, business partnerships, public policy and advocacy. For more information, see: www.cleanegroup.org or www.cleanenergystates.org.

2. The states are California, Connecticut, Delaware, Illinois, Massachusetts, Minnesota, New Jersey, New Mexico, New York, Ohio, Oregon, Pennsylvania, Rhode Island, Texas and Wisconsin. Each of the state funds has its own definition of "clean energy" technologies that are eligible for support, including energy production from solar, wind, small hydro, biomass, ocean thermal, tidal and wave, and fuel cells, as well as related energy storage and conversion technologies.

3. See www.cleanenergystates.org/case.html.

4. A more comprehensive description of CEG and CESA projects can be found at www.cleanegroup.org and www.cleanenergystates.org.

Making agriculture more sustainable: trends and challenges

Summary

A number of approaches that could support sustainable consumption and production in world agriculture were identified at SCP8. A more in-depth version of this article was presented as a background paper for the parallel session on "Sustainable Agriculture: Feeding the Billions". Contributions by panellists and comments made during discussions were subsequently incorporated. The benefits of developing and applying Better Management Practices (BMPs) are highlighted. The example of cotton illustrates the potential for introducing BMPs aimed at making trade flows more sustainable.

Résumé

Plusieurs approches pouvant favoriser des modes de consommation et de production durables dans l'agriculture mondiale ont été discutées lors du séminaire SCP8. Une version plus approfondie de cet article a servi de document de référence à la session parallèle sur le thème : « Agriculture durable : des milliards de personnes à nourrir ». Elle a été ensuite complétée par les communications des intervenants et les commentaires faits pendant les débats. Elle fait ressortir les avantages de l'élaboration et de la mise en œuvre de meilleures méthodes de gestion. Elle montre, avec l'exemple du coton, qu'il est possible d'adopter de meilleures méthodes de gestion ayant pour but de rendre les flux commerciaux plus durables.

Resumen

Durante la CPS8 se identificaron diversos enfoques capaces de apoyar el consumo y la producción sostenibles en el ámbito de la agricultura alrededor del mundo. Se presentó una versión más analítica de este artículo como documento de referencia para la sesión paralela titulada "Agricultura sostenible: alimentar a miles de millones". Posteriormente, se incorporaron las aportaciones de los panelistas y los comentarios hechos durante el debate. El documento destaca las ventajas de formular y aplicar Mejores Prácticas de Gestión (MPG). El ejemplo del algodón ilustra el potencial que tiene introducir MPG orientadas a fomentar la sostenibilidad de los flujos comerciales.

The cost of unsustainable agricultural practices

Land resources – fragile, finite and non-renewable – occupy less than one-third of the Earth's surface. Not only is land the basis for terrestrial plant and animal life-support systems and agricultural production; it also provides support for biodiversity, regulation of the hydrological cycle, carbon storage and recycling, and other ecosystem services.

The last 100 years have seen tremendous changes in the global economy and climate patterns. Globalization has resulted in new forms of production, exchange, consumption and governance. The world population has doubled over the last half century, putting more pressure on the planet to meet its needs. At the same time, environmental pressures (including climate change, pollution of surface and groundwater, soil erosion and biodiversity loss) are reducing productivity in the agricultural sector.

The driving pressure on land resources is food production. Food and fibre productivity has dramatically increased due to new technologies, mechanization, increased use of chemicals, specialization, and government policies that encourage maximizing production. However, population growth is racing ahead of food production in many parts of the world (see the article by Lester Brown on page 8).

Agriculture plays a crucial role in addressing the needs of a growing population, and is inextricably linked to poverty eradication, especially in developing countries.

WSSD Plan of Implementation

Achieving high levels of production has had significant costs. These include topsoil depletion, groundwater depletion and contamination, loss of biodiversity in agro-ecosystems, increasing production costs, a decline in the economic situation of small and family farmers, neglect of the working conditions of farm labourers, and the deterioration of economic and social conditions in many rural communities.

As the world population has increased, forests have been converted to cropland and pastures. More than a quarter of tropical and subtropical conifer forests and mangroves are now used for agriculture. Since 1972, more than 500,000 km^2 of the Amazon rainforest (13% of the region) has been converted to agricultural use. The rate of conversion to cropland and pastures shows no sign of diminishing, as world food demand is likely to increase 50-60% by 2030.

While inappropriate forms of agriculture have the potential to be very destructive, this sector has a key role to play in poverty alleviation and development. Small-scale agriculture employs at least one billion people worldwide. These farmers live in Latin America and the Caribbean, Southeast Asia and Africa, and produce commodity crops such as cotton, coffee, cacao, sugar, fruit and vegetables. Coffee and cacao occupy 27 and 20 million acres of land, respectively, and many of these farms overlap with the world's most species-rich areas.

New ways to farm must be found to sustain both the revenues from agriculture and its resource base. To do this we must address the linkages between unsustainable agricultural practices, failing farms, rural poverty and biodiversity loss, which are increasingly well documented and understood. Most rural inhabitants in developing countries are farmers, with no real alternatives to provide their livelihoods. Agricultural sustainability is the key to their survival in many cases, as well as to the well-being of natural ecosystems.

In many countries, water demand has climbed as water tables have fallen. The average individual daily drinking water requirement is about 4 litres per day, but the water required to produce food for one person for one day can exceed 2000 litres. Also in many countries, too much water is drawn from groundwater sources to allow adequate replenishment (recharge) or these sources are not renewable.

Degradation of cropland seriously impacts agricultural productivity. One-third or more of topsoil is being lost through erosion more rapidly than new soil can form. Where such losses are already high, productive land is turning into wasteland or desert.

One of the main examples of unsustainable management in the agriculture sector relates to land competition. As urban areas expand, prime cropland is being used to meet urban land needs (homes, commercial development and infrastructure). Agriculture is therefore expanding into wetlands and other sensitive ecological zones that are

Applying BMPs

The overall objective of sustainable agricultural production is to balance environmental health, economic profitability, and social and economic equity. One promising approach focuses on applying Better Management Practices (BMPs), particularly at the production stage. The potential for BMPs use in the agriculture sector is addressed in a report developed for the Corporate Citizenship Facility of the International Finance Corporation (IFC) and WWF-US by the International Institute for Environment and Development (IIED), ProForest and Rabobank International (see References). While actual approaches differ among commodities, "there is considerable agreement among responsible producers and other experts that BMPs would mitigate many of the negative environmental and social impacts." [1]

Better (or Best) Management Practices are especially attractive given the financial community's leverage potential for promoting sustainable agriculture. Nevertheless, some pressures on habitat, and macroeconomic issues such as terms of trade, subsidies and structural oversupply, cannot be solved by BMPs. Furthermore, farmers are more likely to adopt BMPs if they contribute in a significant way to productivity gains or reduce costs in the short to medium term.

Similarly, there are often barriers to adoption of BMPs by small-scale farmers, especially with respect to their limited access to technical know-how and their limited capacity to invest financial and other required resources. The challenge is one of combining sustainability with profitability, and expanding agricultural trade flows from developing countries.

How can governments help promote BMPs?

Government policies at all levels are critical to implementing sustainable agricultural practices. Policies that should be developed to encourage sustainable practices include:

- food and agricultural policies that promote environmental health, economic profitability, and social and economic equity;
- land use policies that link land tenure and sustainability;
- trade policies that provide incentives such as lowering of tariffs and other trade barriers for products of sustainable agriculture. Integrated assessments of agricultural trade liberalization can be undertaken to identify the linked economic, environmental and social effects and design policy responses that support sustainable agricultural development and trade;
- policies that foster rural community development, encouraging diversified agricultural production on family farms;
- sustainable public and private sector management policies for water supply, quality and use, plant production practices, and improvements in farming and soil systems;
- GMOs-related policies. The use of GMOs raises a whole range of sustainability-related issues for small-scale farmers in developing countries. While this technology can help overcome the constraints of such farmers operating on marginal lands (reducing the amount of environmentally damaging inputs), it can also increase the damage. GMOs use can be inappropriate for small-scale farming or beyond the farmers' economic reach. These variable effects require careful design of complimentary policies if their introduction and use is to support environmental sustainability and poverty alleviation;
- policies that promote conservation and recuperation of ecosystems on and near the farm, thereby protecting biodiversity.

How can trade and financing promote BMPs?

- Private investment can encourage export-oriented sustainable agricultural enterprises. National policy-makers in the trade and finance sectors, development cooperation agencies and the financial sector with the greatest interest in agriculture, and agribusiness companies, can take part in defining investment frameworks that encourage sustainable production and trade. It is also important to address access to credit issues for smallholders and small-scale farmers. Lack of security, and banks' unwillingness to extend loans to this sort of farmer, create an important barrier. Other ways in which buyers could provide finance through the supply chain can be identified.
- The support of markets for the products of sustainable agriculture is critical for encouraging farmers to adopt approaches such as BMPs. Enterprises can develop "standards of conduct" that encourage farmers to adopt more sustainable practices. Technical advice and financial support could also be provided by enterprises to farmers that supply food to these enterprises. Standards could be set, as appropriate, for inputs to agricultural activities.
- The development and application of appropriate methods and technologies at the farm level, via mechanisms such as extension services, will be critical for sustainability. This requires finance, research and technical innovation, in addition to an extension network that reaches farmers on the ground. More cooperation and pooling of resources between the public and private sectors could be critical in order to respond to changing market conditions and sustainability challenges.

Additional initiatives

Further steps that could be taken to promote this approach include:

- clarifying how the concept of sustainable agriculture can be translated to realistic and practical, on-the-ground practices such as BMPs through developing guidelines that define what sustainable agriculture means in practical terms, documenting BMP examples, and facilitating the sharing of these examples among mainstream industry stakeholders;
- developing a marketing strategy to improve the image of products from sustainable agriculture, in order to educate consumers and intermediate companies about the benefits of buying sustainably produced products and encourage industry to support sustainable agriculture practices. There is a need to develop communication materials and use "champions" to pass the message to target groups (consumers, intermediaries and producers). In addition, directories of sustainable products and companies should be developed;
- developing a business case for sustainable agriculture to engage mainstream business. The business case should showcase the proven benefits of sustainable agriculture, benchmarking of benefits, Business to Business (B2B) benefits, and benefits to intermediaries. Furthermore, the business case should identify barriers and opportunities for sustainable agriculture, as well as the potential for continuous improvements (as opposed to immediate best practices);
- helping to secure financing mechanisms to assist companies' transition, and working with governments to provide incentives for this transition.

1. The report is intended as a basis for discussion regarding future work on BMPs and agribusiness commodities. For each of four selected commodities (cotton, palm oil, soy and sugar) it presents background information on: key environmental impacts, prospects for tackling these impacts through the adoption of BMPs; and preconditions, risks and strategic choices in relation to developing a BMP approach.

essential for sustainable water management and biodiversity protection. Many small farmers are being forced to move to marginal land. According to the World Bank (2003), the segment of the population dependent on fragile land in the year 2000 was about 40% in sub-Saharan Africa, 38% in the Middle East and North Africa, 25% in East Asia and the Pacific, 24% in South Asia and 13% in Latin America and the Caribbean.

Global application of chemical fertilizers increased from some 14 million tonnes in 1959 to some 137 million tonnes in 1998. (Pesticide use results in an estimated 3.5-5 million acute poisonings a year.)

Since agriculture began, more than 7000 species have been used as food or animal feed. Today only 30 crops provide 95% of the world's food supply.

Intensive agricultural production includes excessive application of nitrogen-based fertilizers or animal manure, resulting in high nitrate levels in groundwater. In many areas these levels are high enough to threaten human health. Phosphate in run-off from cropland enters surface water, sim-

Cotton: a good candidate for BMP

Cotton is the largest money-making non-food crop produced in the world. Its production and processing provide some or all of the cash income of over 250 million people and employ almost 7% of all labour in developing countries. Nearly all activities associated with cotton production, processing and manufacturing are becoming more concentrated in the hands of fewer companies and fewer countries. About half of all textiles are cotton.

Cotton is grown in some 100 countries The major producers (by weight) are China, the United States, Pakistan, India, Uzbekistan and Turkey. About two-thirds of the world's cotton is produced in less developed countries, with China the largest of these by far. In the 1980s several African countries increased their cotton production. For several (including Benin, Burkina Faso, Chad, Mali, Sudan, Togo, Zambia and Zimbabwe) cotton is one of their top two exports by value.

The international cotton trade is dominated by a small number of companies. Ten of them directly control over 60% of world trade in cotton. However, in some countries (e.g. Uzbekistan) the government plays a role in marketing raw cotton. Merchant operations within the various components of cotton production and distribution are largely controlled by private companies and financed by a range of local and international banks (including Rabobank International, ABN Amro, BNP Paribas and Société Générale).

The July 2004 WTO agreement prioritizing the reform of cotton subsidies within the broader negotiations on liberalization of agriculture could create a new dynamic for change in this sector, as well as new opportunities for promoting sustainable production and trade in this crop.

Two key issues related to sustainable cotton production are water management and pest management. Cotton is highly water-intensive, and (largely due to its long growing season and fruiting pattern) highly pest-sensitive. About 73% of global cotton production comes from irrigated land. Although cotton is grown on only 2.5% of the planet's arable land, it accounts for 25% of all insecticide consumption. The overall efficiency of water use in irrigating cotton is low, with only 20-50% of diverted water actually reaching the crops.

Cotton is associated with ecological crisis related to poor water management and discharge of toxic substances (from pesticide overuse) to the environment in semi-arid and water-scarce regions including the Aral Sea and the Yellow River in eastern China, where cotton production is associated with falling water tables and unreliable surface water flow. Related health/social issues include worker illness from exposure to pesticides during application and harvesting.

Environmental degradation resulting from monoculture production and the overuse of resources has now started to have a direct impact on current cotton production capacity in countries. A major obstacle to improved water management in cotton production is the absence of community management of irrigation systems or market pricing of water resources.

In West Africa the main challenges for cotton production are similar to those in other parts of the world, notably salinization in the Niger and Senegal river basins and high incidence of pests.

Priorities for sustainable cotton production in West Africa include reduction of water consumption and the use of agro-chemicals, similarly to other cotton producing areas. However, what is probably a more unique priority in West Africa is related to the need to minimize conflicts between cotton farmers, mobile pastoralists (who are dependent on wetter areas, with access to water for dry-season grazing of their herds), and wildlife, which in turn is linked to tourism opportunities

Many aspects of cotton production are conducive to a BMP approach. Such solutions are "win-win", in that they promote sustainable production (especially in terms of preserving the natural resource base) and reduce the costs of production, which have reached very high levels in some countries. Improved water management can reduce withdrawals from rivers and groundwater, protect soil from salinization and preserve downstream habitats from saline drainage water. Integrated pest management can prolong the effective life of pesticides and reduce health hazards for labourers. These measures must be applied on an area-wide basis to be effective. BMPs include drip, sprinkler and alternate furrow irrigation (this would not apply to upland cotton in Brazil, southern India, West Africa and parts of the United States). BMPs are also aimed at improved pesticide application to reduce the quantity of pesticide missing the target and for integrated pest management (IPM), including use of selective insecticides and conservation of natural enemies. Furthermore, better plant health (e.g. through sound fertilizer management) yields reduced stress and less pest damage.

Integrated pest management has been adopted by 60% of Brazilian cotton growers, resulting in a reduction of pesticide applications from 22 to 12 per season, even with new boll weevil pests present. The challenge is to make these techniques available to smaller producers.

In Australia, the Best Management Practices Programme has generated a BMP manual. This manual allows self-assessment of farm practices against BMPs, most importantly those related to application of chemicals. An auditing system is managed by Cotton Australia. In 2002-3, 55% of the cotton crop was produced using the BMP approach. Measures include safe chemical storage and handling, reduced chemical usage, minimization of erosion, minimization of storm impacts, and good communication with neighbours, spray operators and advisors. Among the benefits are access to chemicals, access to water, reduced input costs, lower insurance premiums, better access to finance, tax concessions, government grants for BMP applications on farms, premium prices for BMP cotton, licenses to continue to cotton-growing, access to new markets, and greater demand for Australian cotton on a world scale.

It is important to note that in the case of some commodities, only a limited proportion of production is traded internationally. The remainder is consumed and/or processed into finished goods domestically. Therefore, changing production practices would need to take into account domestic as well as international markets.

ulating the growth of algae. Erosion associated with conventional tillage and lack of proper crop rotation degrades soil and causes silting of surface water bodies. Traces of the pesticides used to control insects and plant diseases can be found in foods, animal feeds, groundwater and surface water. Farmers and farm workers exposed to these chemicals are at considerable risk.

The high cost of purchased inputs (especially hydrocarbon-based artificial fertilizers) and the fluctuating and declining prices of many agricultural commodities put great pressure on farmers. Low prices lead to the prioritization of short-term financial returns over investment in more sustainable production methods, leading to further land and environmental degradation.

Making world agriculture more sustainable

In general, trends in world agriculture appear to favour:

- consumers over primary producers;
- exporters over domestic suppliers;
- the capital-endowed over the natural resource-endowed.

To work towards sustainability, the challenge is to identify and build more effective links between regional food production systems, natural resources, the market, the state and civil society. More dynamic and creative interactions between farmers, local communities, government agencies, the private sector, and regional and international bodies would favour both sustainable agricultural production and profitable trade.

Stakeholders need to be able to build upon initiatives already under way, leverage existing partnerships and build new ones where needed, with the aim of supporting changes that will enable sustainable production, particularly in the case of

small-scale farmers in developing countries.

Five trends that affect the structure and dynamics of agri-food systems in many parts of the world can be identified. These trends (which fall under the umbrella term "globalization") are associated with the removal of barriers to trade and investment through liberalization, deregulation, and consolidation and vertical integration of supply chains:

- Trade liberalization means that farmers and processors increasingly compete at prices and quality standards set by world markets and absolute comparative advantage (including levels of subsidization). However, liberalization of the agriculture sector so far has left many developed country subsidies intact, contributing to overproduction and the "dumping" of subsidized products in some markets.
- Deregulation of foreign investment gives governments less scope to attach conditions to investment, such as obliging companies to source from domestic producers and land reform beneficiaries.
- Withdrawal of the state from agriculture directly exposes farmers and manufacturers to the vagaries of the market. While there are high expectations that deregulation will work for small and family farmers, reduced government support for research, extension and capacity building could hamper those farmers' ability to take advantage of new markets.
- The ascendance of regional and global retailers and food processing companies, even in small and relatively poor economies, is restructuring the governance and operation of agri-food supply and value chains and driving the consolidation of food processing/manufacturing.

Other drivers of change include business strategies and consumer behaviour. Some drivers (e.g. the rapid ascendance of retail chains) remain largely beyond the scope of current public policies.

UNEP's objective in the sustainable agriculture area is to develop activities that catalyze the policy integration process and harness the private sector's innovation and technical and financial resources.

Development and implementation of practices that are environmentally sound and more economically rewarding for farmers provide "win-win" solutions for the agricultural community. Meeting the following broad objectives is critical to securing these solutions:

- training producers in developing countries in sustainable agriculture practices;
- developing supportive national policy frameworks;
- stimulating private investment, including foreign direct investment (FDI), in export-oriented sustainable agricultural enterprises;
- stimulating and supporting market linkages and incentives for sustainably produced commodities;
- removing or reducing trade barriers which limit market access for sustainably produced products, including those from organic farming systems;
- funding initiatives that demonstrate Better (or Best) Management Practices (BMPs) designed to be replicable across crops and/or geographical regions, and helping to disseminate and advertise results.

Specific activities that contribute to meeting these objectives include:

- identifying agricultural products from developing countries with potential for export growth, and identifying the associated environmental and natural resource management challenges;
- building partnerships among governments, relevant intergovernmental organizations, the private sector and NGOs to address these challenges, in the context of specific agricultural trade flows;
- prioritizing the needs of least developed countries/heavily indebted poor countries (LDCs/HIPCs).

Approaches for implementing more sustainable agriculture practices are, of course, dependent on local conditions (e.g. climate, existing farming practices, income, water availability). Possible general constraints include:

- government policies that ignore sustainability considerations, or suffer from an absence of the political will and financial resources necessary to implement the sustainability elements;
- a range of macroeconomic issues and policy tools, including price volatility, trade liberalization and agricultural subsidies, whose effects need to be addressed;
- specific challenges that need to be addressed with new approaches and tools (e.g. traceability of products through the supply chain);
- poorly informed stakeholders, leading to inadequate understanding of the negative impacts of unsustainable farming practices and of the benefits of sustainable agricultural practices;
- poorly developed market linkages and the absence of incentives that support measures to encourage sustainable production;
- access to capital, which is a critical issue, especially for small-scale farms in developing countries. There is considerable potential for public-private partnerships to tackle the problem of capital scarcity;
- potential that, in the short term, sustainable agricultural practices may be less profitable than conventional practices, and/or will require significant initial financial investment;
- absence of extension services to support small-scale farmers in adapting or switching from traditional farming practices;
- difficulty in altering consumer behaviour, which may require a combination of altered price signals, awareness-raising, and clear and trustworthy information tools;
- poor coordination among stakeholders (especially those responsible for water management).

Future roles for the public and private sector and civil society will require new alliances and working modalities. Some examples can already be cited, e.g. the Rainforest Alliance (see page 24). The role of the public sector includes promoting and fostering such alliances.

UNEP, in particular, is working to develop demonstration projects with tangible results that can then be replicated elsewhere. These efforts are in line with its mandate to provide an impartial forum for the exchange of best-case practices, and for convening decision-makers at the international level to promote better policy-making.

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Rainforest Alliance: mainstreaming sustainable agriculture

The Rainforest Alliance is an international NGO that certifies forests and farmland as sustainable. Globally, it has certified more than 36 million acres of forests. It also certifies 15% of the world's internationally traded bananas and 14% of its certified coffee, among other crops.

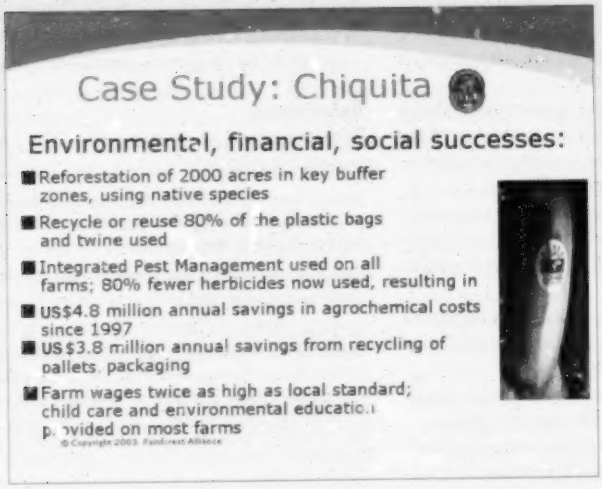
Producers take part in Rainforest Alliance certification in order to access markets interested in sustainability. However, there are many other benefits, including:

- reduced labour turnover;
- reduced insurance costs;
- increased productivity;
- reduced chemical costs;
- increased biodiversity conservation.

The Rainforest Alliance engages with small producers, large farms and international traders, importers and retailers. Farms are audited annually against more than 200 sustainability criteria.

The Rainforest Alliance works with buyers and retailers to help farmers access new markets and obtain better prices for their certified products. The United Nations now serves Rainforest Alliance Certified coffee. Ben and Jerry's uses it to flavour their Coffee for a Change™ ice cream. Millstone, a premium brand from Procter & Gamble, is selling a Rainforest Alliance Certified coffee in 3700 supermarkets.

Rainforest Alliance Certified farms sell to many specialty roasters. Sustainable coffee has also begun to enter mass markets. Kraft, one of the world's leading coffee roasters, purchased 5.3. million pounds of RA-certified coffee in 2004 – an unprecedented amount of sustainably grown coffee – and is committed to more than doubling that amount in 2005. It is putting most of this certified coffee into its mainstream brands.


Case Study: Chiquita
Environmental, financial, social successes:
Reforestation of 2000 acres in key buffer zones, using native species
Recycle or reuse 80% of the plastic bags and twine used
Integrated Pest Management used on all farms; 80% fewer herbicides now used, resulting in
US$4.8 million annual savings in agrochemical costs since 1997
US $3.8 million annual savings from recycling of pallets, packaging
Farm wages twice as high as local standard; child care and environmental educatio
provided on most farms
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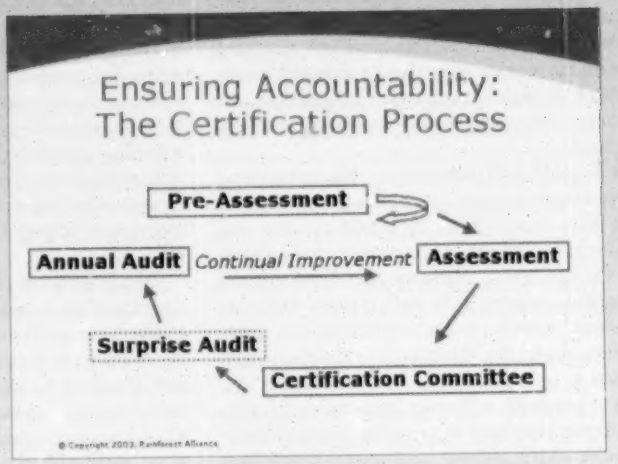

This mainstream success story is by no means limited to coffee. The large banana companies Chiquita and Reybancorp (Favorita Fruit Company) have achieved and maintained 100% certification of all company-owned farms. Rainforest Alliance Certified bananas currently make up more than 90% of Chiquita's total volume exported to Europe, and approximately two-thirds of that exported to North America.

What does certification mean on the ground? At the Salvadoran cooperative of Las Lajas, for example, receiving a premium for their Rainforest Alliance Certified coffee has helped the cooperative maintain social services such as free daycare for the children of women who work on the farm, and a clinic that not only provides basic health care for coop members but for people from nearby communities as well.

On Chiquita farms throughout Central America, it has meant a significant reduction in chemical use, an 80% reduction in use of plastic bags and twine, and reforestation of key waterways and wildlife areas. In northwest Honduras, coffee farmers have made a series of improvements on their farms that include prohibiting hunting, cleaning up nearby streams and planting 120,000 native trees.

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Tomorrow's consumer

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Summary
This overview of tomorrow's consumer is based on selected data collected in Mexico, China, India and other countries, as well as the author's experience in the marketing field. Consumers of the future might be better thought of not as "consumers" at all but as "and and people" – that is, purchasers who will be looking for quality of life and quality products and low prices and ways to make the world a better place. To promote sustainable consumption, three areas of action are suggested: create focus and inspiration around the idea of sustainability; provide "and and" purchasers with the information they need to make better choices; strengthen the capabilities of all players to respond and communicate.

Résumé
Cette description du consommateur de demain se fonde sur des données recueillies au Mexique, en Chine, en Inde et dans d'autres pays, ainsi que sur l'expérience de l'auteur dans le domaine du marketing. Il serait peut-être plus juste de considérer les consommateurs du futur non plus comme des « consommateurs », mais comme des personnes ayant des exigences multiples, c'est-à-dire recherchant à la fois une qualité de vie, des produits de qualité, des prix bas et les moyens de rendre le monde meilleur. Pour promouvoir des modes de consommation durables, trois axes d'action sont suggérés : focaliser l'attention et créer un modèle autour de l'idée de viabilité à long terme ; fournir aux acheteurs à exigences multiples les informations dont ils ont besoin pour faire de meilleurs choix ; renforcer la capacité de tous les acteurs de répondre à ces exigences et de communiquer sur le sujet.

Resumen
Este panorama general del consumidor del mañana se basa en la selección de datos recopilados en México, China, la India y otros países, además de la propia experiencia del autor en la esfera de la mercadotecnia. Sería mejor pensar en los consumidores del futuro no como "consumidores", sino como "personas y-y": compradores en busca de calidad de vida y productos de calidad y precios bajos y oportunidades para hacer de éste un mundo mejor. Se sugieren tres líneas de acción para fomentar el consumo sostenible: hacer de la noción de sostenibilidad el centro de atención y motivación; brindar a los compradores "y-y" la información necesaria para tomar mejores decisiones; fortalecer las capacidades de respuesta y comunicación de todos los actores.

This is an edited version of the author's presentation to the working session on sustainable consumption at SCP8.

By way of introduction, I'd like to take you on a short imaginary journey to my neighbourhood in Toronto. It's in the inner city. We'll walk three blocks, through a park, past my kids' high school to a large enclosed shopping centre called the Dufferin Mall. It has 50 stores, including a Walmart, a discount grocers and fast food outlets.

In the Walmart we will pass two greeters: a man from the Azores and a woman from Colombia. The sales clerks at Footlocker include young men from Sudan, Jamaica and Hong Kong. The woman at the cash is from Mumbai. As we walk the mall, we will pass people from quite literally 100 countries or more. This is no surprise to a Torontonian; half the city's population was born somewhere else than Canada. In fact, the UN analysed the census data for this area and declared it to be the most ethnically diverse place in the world. The Dufferin Mall, in a sense, is as good a microcosm of the global consumer class as you are likely to find.

It is also a timely reminder for me that I need to begin this presentation with a caveat. Call it the Dufferin Mall caveat. A stroll through the Dufferin Mall is a dramatic reminder that when it comes to talking about people around the world, one size does not fit all. That a 20-minute overview of tomorrow's consumer is in fact a crazy and dangerous undertaking, because no presentation could possibly reflect the most important truth of all: the fabulous complexity and diversity of human cultures and people.

Beyond the qualifications of living near the Dufferin Mall, I am also a director of social marketing for J. Walter Thompson, a worldwide ad agency. It is part of WPP, the largest marketing services company in the world, a group that includes research, media, public relations and consulting services operating in more 100 countries. I've been involved with UNESCO on a Type 2 partnership presented at the World Summit for Sustainable Development.[1] The project focused on the notion that for sustainable development to progress, greater demand for it was essential. I am also a member of UNEP Advertising and Communication Forum on Sustainability (see www.uneptie.org/pc/sustain/advertising/advertising.htm.)

Today I'm here not to represent our clients (many of whom, by the way, are supporters of sustainability), but as a specialist hoping to add something to the most important challenge of our generation.

In the next 20 minutes – with the Dufferin Mall caveat in mind – I'd like to present an overview of tomorrow's consumer. This will be based on WPP sources; TGI (Target Group Index), a large study carried out in 30 countries with a population of 120 million people; and the London-based Henley Centre and its global report, *HenleyWorld*. I apologize in advance because although this is a good start at global tracking, it is not comprehensive. There are data from Mexico, but not the full picture from Latin America. Data from China and India are from selected consumer groups in 30 and 40 urban centres, respectively. I will also make brief references to Globe Scan and Environics.

The frame of reference for this overview is the global consumer class, as defined by Worldwatch:[2] 1.7 billion people, 45% of which are in developing countries. This so-called class is at different stages of development, but it shares similar patterns of product, service and media consumption.

I will highlight findings from these sources, offer a way of thinking about the consumers of tomorrow, and end with suggestions for three areas of action.

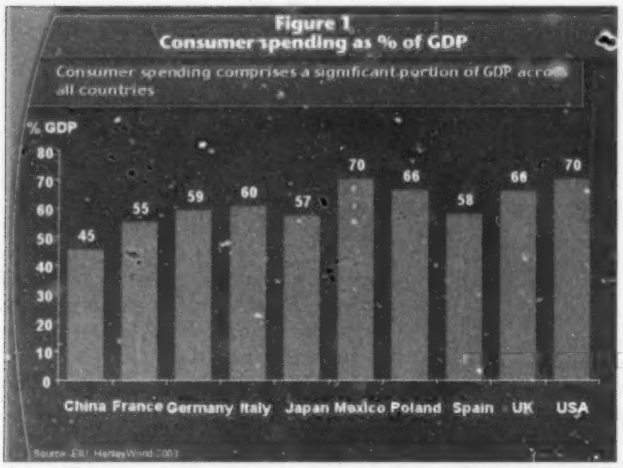
The future is here

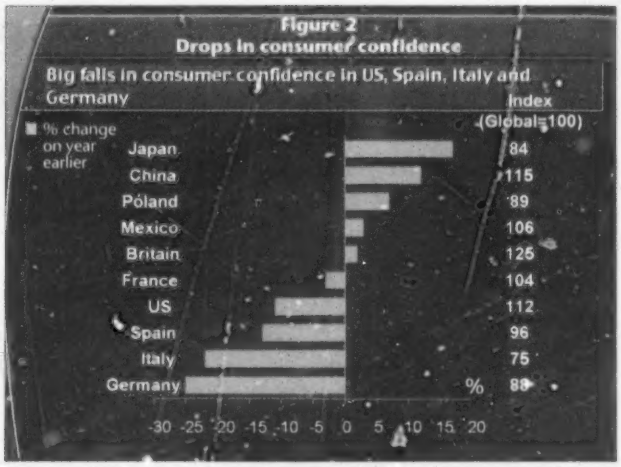
The first claim I'd like to make is that tomorrow's consumers are all around us. In the words of the author William Gibson: "The future is here. It is just unevenly distributed."

The attitudes and behaviours are all there. They are differently distributed by region and by age, but the directions and patterns are clear. In many ways, the consumer rules as the primary economic engine of GDP.

Consumer spending is such a dominant factor in driving GDP that its influence will only increase in the future. Consumer spending as a percentage of GDP is growing fast in China. It is as high as 70% in Mexico (**Figure 1**).

Meanwhile – and I make these comments with full respect for the much graver problems of the world's poor – consumers themselves feel they are having a difficult time. **Figure 2**, for example, shows significant decreases in consumer confidence in the United States, Spain, Italy and Germany compared with a year earlier.





In most developed countries, real incomes have been flat for more than a decade, job security has been eroded with the growth in outsourcing, the lower-paying service sector and part-time jobs. There have been two recessions. Students today are routinely warned that they will have many jobs over their careers and should prepare themselves as free agents. The Henley Centre refers to this as the emergence of a "Risk Society".

In many lives these economic realities have led to more challenging lifestyle decisions. In developed markets, 80% of women now work outside the home (but continue to do more than 75% of the household chores). Holding two jobs is common. Urban living is more increasingly congested and expensive.

Not surprisingly, time is a big issue. There is not enough of it. In France, over 70% of adults say they do not have enough time to get things done. This is nearly twice as high as the percentage in China.

What is on the minds of the consumer class around the world? Answer: money, followed by time.

Targeting the consumer class: overload and mistrust

With so much overcapacity in production, companies will continue to focus more and more on the consumer. One effect of this is, and will continue to be, a surge in advertising and the consumption of media in all its forms.

Worldwide *annual* ad expenditures will soon top US$ 500 billion. $21 billion dollars is spent annually on movies. The penetration of video games has now reached 430 million people and, by the way, they enjoy higher sales in the United States than all of Hollywood's box office. Internet access in the consumer class ranges regionally from 25 to 75% and is rising. In some markets in the US, Internet advertising is at levels comparable to television.

To give just one example, we calculated that in a single year the average Canadian will change TV channels 48,500 times. Most Canadian men think that number is way too low.

Cell phone penetration in urban China is now as high as in the US. With Internet, e-mail, games and photo capability, cell phones have already revolutionized connectivity and networking for many.

The cumulative effects of these cross-currents are extensive. First is overload. *Henley World* data for 2003 show that the portion of people in seven developed countries who felt frustrated because they lacked the time or energy to use the information they have to its full advantage ranged from 29% in Japan to 57% in Spain. For marketers this development is a nightmare, and for people who want to engage other people with new ideas it's a big barrier.

Second, in many markets we have created a population of marketing and media experts. Schools now teach media literacy, and you can go to focus groups in most places in the world and the attendees will gladly deconstruct your marketing strategy for you.

This ever-intensifying media universe has spilled into the developing world, helping to fuel consumer appetites and link these populations as never before to the consumer cultures of the west.

Equally significant, this deluge has coincided with (many would argue that it is a cause of) a change in the levels of trust people place in authority and institutions, e.g. companies, religious institutions and the legal system. There has even been a decrease in trust in NGOs and the UN. And in government, especially at the national level (**Figures 3 and 4**).

In China pollsters were told that people had greater trust in Sony than in their colleagues at work. Trust in media is very low. In Mexico there are some significant differences: there is high trust in the church and remarkably high trust was reported in the Sony brand, but otherwise attitudes are similar to those in developing markets.

Consumer attitudes to social issues

Now, what about sustainability? Attitudes and behaviour associated with the environment, sustainability and ethics? Issues that are as much about citizenship as about consumption?

Recycling is a broadly expected duty across the planet. Among the countries in **Figure 5**, it is lowest in the US and highest in Mexico.

Concern about pollution and congestion is at 50% plus. Consistent with this, a sizeable portion of people (upwards of 50% of those surveyed in China) say they are willing to pay more for environmentally friendly products.

Likewise, Globe Scan research has indicated that upwards of 22% of consumers claim to be actively green in their attitudes to products. And an Environics study suggests that social responsibility is more important than brand quality in evaluating a company.

Of course, people say one thing to pollsters and do another. Trust, confusion, and the constant presence of more pressing priorities are obvious barriers. So, too, is the shortage of environmentally friendly product options in the marketplace.

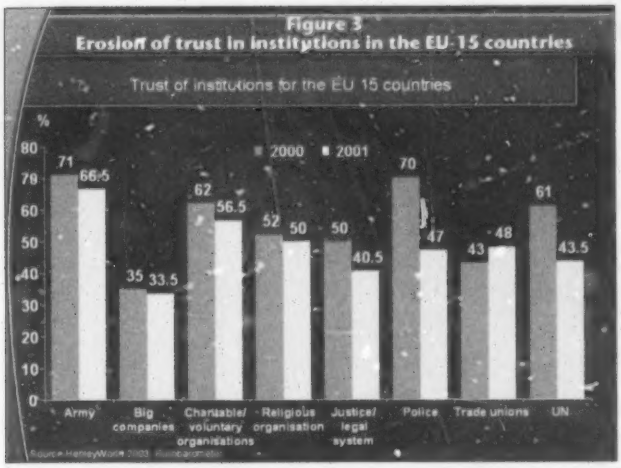
Consumers today are not entirely inactive (**Figure 6**). Many, in fact, are taking steps in an indirect way. Jeremy Bullmore, a noted marketing commentator and author, has coined the phrase "the Objective Disqualifier". In the face of too much choice, widespread product parity and too little time, people find it difficult to choose a brand on its merits. As a result, many make choices through a process of elimination – looking for reasons not to buy a certain option rather buying on superior merit. It would appear that this buying behaviour (call it *unbuying*) is one of the ways today's consumers act on their feelings related to sustainability or ethics: a pattern that may point to the future.

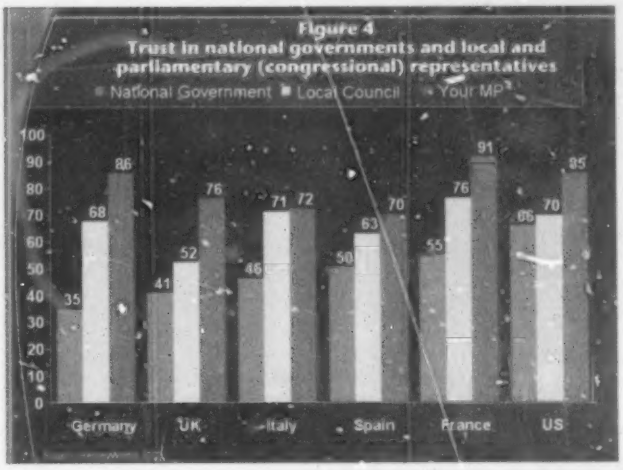
The youth of today will be tomorrow's *and and* consumers

What does all this suggest about tomorrow's consumer?

First, a number of key characteristics of today's consumers will be there tomorrow: chronic and widespread concern about money, job security, family, the future. A feeling that there is too much going on to handle, and not enough time to get things done or use the information that you have. A constant barrage of media and advertising telling you what to buy and what's going on in the world and in your own backyard. Established institutions with low levels of credibility driving you to rely – when you have the time – on your family and close friends in making decisions and forming points of view.

In many respects, the most precious commodity will be time. From a communications and edu-





cational point of view, the hardest thing to achieve will be getting someone's time and attention.

These conditions are creating a generation of consumers who will be deeply sceptical, tremendously demanding, price-sensitive – and, from a marketer's point of view, very disloyal. We are entering the *and and* age. In fact, we are already in it.

People want it all. High quality *and* low price *and* in the right size *and* colour *and* I want it today *and* served with a smile. *And and and.*

These people are not much for compromise. Most will continue to say one thing and do another; will be driven by their primary needs and interests; and (unless things happen) will hold back from acting on their concerns related to environment, sustainability and ethics due to confusion, mistrust and lack of product availability.

Tomorrow's consumers, in other words, will have many of the characteristics of today's *and and* consumer. But to this you must add one critical and obvious component: tomorrow's consumers will be the youth of today.

Many of the trends I shared with you are more pronounced with youth. They are more sceptical, questioning and media savvy. And much more than the norm, they are networked, self-reliant and questioning. They are finding new systems of communication and decision-making, and they are reassessing priorities and values. They have a broader perspective on the world. And they are prepared, more than the norm, to act.

The social agenda in the *and and* world

What are some of the implications? How will the social agenda progress in this *and and* world?

People, including youth, are confused

The issues around sustainability are complex and seemingly unfocused. If you google "sustainable development", for example, you will get more than 1000 definitions. To harness feelings and needs lying just below the surface, the vision of sustainability needs to be defined for a new generation. I suggest that one way to do this is actually to engage the youth of today in finding the answer.

After all, they are the ones who have the most to lose. They are the ones who are motivated. By definition, they disagree with much of what the generation ahead of them has done and they are prepared to challenge the conventions. They are also revered by companies the world over. They are the most sceptical and allusive of all consumers; always one step ahead of being commercialized.

As an example (and I offer this not because I think the solution is about corporate bashing, but rather because it demonstrates the ingenuity and surprise that can come from such a process), several years ago youth were involved in addressing a seemingly intractable problem. Programmes in the US to curb underage smoking were constantly failing. A number of teens and young adults were engaged to figure it out. No restrictions. No strings attached.

They realized that the biggest motivator for stirring action among young people was not to try scaring them with health horrors, but to reveal how big business had misled and manipulated them. They created the TRUTH Campaign.[3] And it worked.

Something similar could be attempted, probably on a region-by-region basis. Gather teams of youth in various parts of the world to help define, in their own terms, what sustainability is all about, and create the beginnings of a campaign for the world. Foundation funded. No strings attached. Regional teams. Professionally supported. With input from interested parties, but no interference.

Trust, transparency and simplicity are essential

Trust, transparency and simplicity are vital ingredients if consumers are to be able to navigate among choices. Marks of trust and better sources of information are critical. Of course, companies need to look at their operations on an enterprise-wide level and earn the trust of their consumers. Many argue that the strongest trust mark should be the corporate brand. But even if corporations progress rapidly in this arena, there will still be a need to strengthen what might be called "citizenship brands".

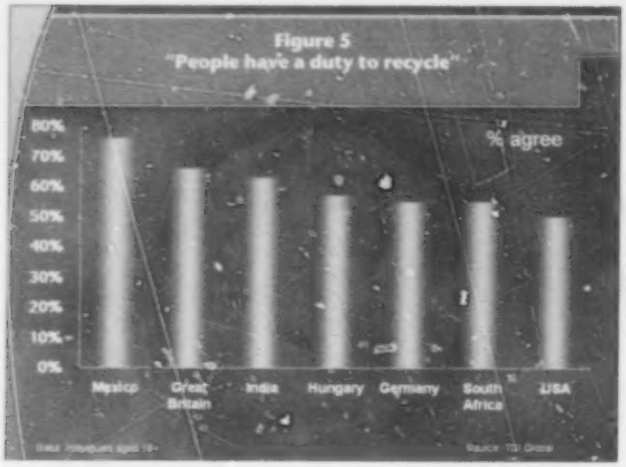
In their earliest days, brands were based on the simple notion of trusting the product to be good, consistent and safe. The consumer of tomorrow needs touchstones to help make decisions on a more complex set of variables.

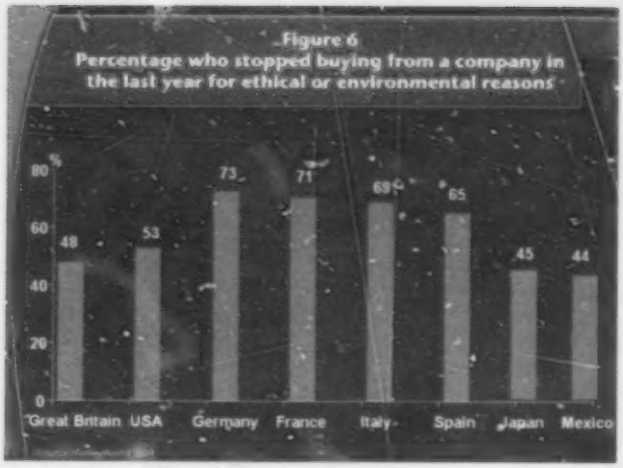
The Global Compact, UNEP and Consumers International (CI) are well positioned to build themselves into stronger touch points of credibility and trust. But a concerted effort and investment are needed to build awareness, stature and relevance. The consumers of tomorrow need clear, simple information readily available. Bloomberg has spawned a billion dollar industry informing investors. What's the service for consumers?

Lastly, there are significant implications related to communications and marketing. Anyone who wishes to communicate a commercial or social message, including the private sector, would do well to stop thinking of consumers and start concentrating on people. The term "consumer" (i.e. "one who acquires goods and services") seems woefully off the mark when you think of what has happened to the behaviour and attitudes of people over the past decade. Use of this term has been an invitation to ignore the full dimensions of people's lives and needs and, at times, to create an unreal separation between companies and the people they serve (as well as governments, for that matter). And it results in an inadequate understanding of how to reach them and build trust.

Companies will continue to scramble to meet *and and* consumer demand. But instead of complicating their offering, they will have to simplify and (in a sense) humanize the way they market their brands if they hope to establish any modicum of loyalty. Progressive companies will realize that there is competitive advantage in demonstrating how they are part of the human race, not just the push to profit.

Related to this is one final suggestion with respect to capacity building. The quality and effectiveness of communication related to social change is very uneven. This is true of not-for-profit organizations, governments and corporations. Meanwhile, UNEP has been developing best practices in corporate social responsibility (CSR) and communication (see www.uneptie.org/outreach/compact/policydialogue2004.htm.) Academia and government are gathering research and best practices. Thousands of organizations, governments, NGOs and companies are launching programmes and communicating with the pub-





lic. These are huge efforts, but disconnected and inconsistent.

There are also difficulties in accessing information and the experience of others that might encourage better campaigns, or more accelerated efforts on the part of companies that are afraid to step forward. What this calls for is consolidation of work and learning; a source of ideas and a focal point for help. A pilot programme proposed between JWT, AD forum, UNEP and UNESCO is currently being discussed and considered. It is an initiative that would fit within the goals of the UN Decade for Education on Sustainable Development that is being launched in 2005.

Call it a world forum. A web-based service to provide best practices, tool kits, guidelines, even the recycling of communication campaigns and ideas for NGOs, governments and companies.

To conclude, tomorrow's consumers are better thought of not as consumers at all, but as *and and people*. They want quality of life *and* quality products, *and* low price *and* a better world to pass on to their children. But clearly there's a long way to go before they do what they say. I have suggested three areas of action that, among a long, long list of needs, could help move things forward:

- create focus and inspiration around the very idea of sustainability;
- provide the *and and* world with the means to make better, more informed choices;
- strengthen the capabilities of all players to respond and communicate.

And of course, all of the above is offered with the caveat of the Dufferin Mall.

Notes

1. "Type 2 partnership" was an official designation at the World Summit. The UN invited private-public partnerships to come forward with project initiatives. "Non-negotiated partnerships and initiatives to implement Agenda 21 are expected to become an important element of the outcomes from the World Summit on Sustainable Development. The Summit will not only result in a high-level political declaration and a programme of action for the further implementation of Agenda 21, which are fully negotiated and agreed to by all governments (Type 1 outcomes). Type 2 partnerships will also become an integral part of the Summit, even though they will not be negotiated by all present. Rather, they need only be agreed only by those directly involved, who will commit themselves to taking the partnerships forward and making them a success" (www.sdnpbd.org/wssd/sd-in-action.htm).
2. www.worldwatch.org. The 2004 edition of the Worldwatch Institute's *State of the World* report focuses on the consumer society.
3. www.thetruth.com.

SCP and alternative development models

Summary
SCP8 participants agreed that alternative development models should: encourage economic growth that is more resource efficient and effective, as well as respectful of cultural diversity and human rights; promote economic equity within societies and countries; and incorporate sustainability in financing mechanisms and products to promote alternative development. They also agreed that governments, the private sector, and international and multilateral organizations (working in partnership) should support, promote and implement local, regional and national initiatives that accelerate the shift towards sustainable consumption and production.

Résumé
Les participants au séminaire SCP8 sont tombés d'accord sur le fait que les modèles de développement de substitution doivent : encourager une croissance économique faisant un usage plus rationnel et plus efficace des ressources tout en respectant la diversité culturelle et les droits de l'homme ; favoriser l'équité économique dans les sociétés et les pays ; intégrer le développement durable dans les mécanismes et produits de financement afin de promouvoir d'autres formes de développement. Ils se sont également accordés sur la nécessité que les gouvernements, le secteur privé et les organisations internationales et multilatérales (travaillant en partenariat) soutiennent, encouragent et mettent en œuvre des initiatives locales, régionales et nationales propres à accélérer l'adoption de modes de consommation et de production durables.

Resumen
Los participantes de la CPS8 acordaron que los modelos de desarrollo alternativo deben: impulsar el crecimiento económico más efectivo y eficaz en función de los recursos, respetuoso de la diversidad cultural y los derechos humanos; fomentar la equidad económica al interior de las sociedades y los países, e incorporar el componente de sostenibilidad a los mecanismos de financiamiento y los productos a fin de promover el desarrollo alternativo. Asimismo, acordaron que los gobiernos, el sector privado y los organismos internacionales y multilaterales (en un ánimo de colaboración) deben apoyar, fomentar y aplicar iniciativas locales, regionales y nacionales que aceleren el cambio hacia el consumo y la producción sostenibles.

This article originated as a background document prepared for SCP8. Comments by panellists and other participants were taken into account in this edited version.

The term *alternative development* refers to economic development that combines improved environmental protection and social welfare. Alternative development – which entails sustainable use of natural resources – has been applied in a range of contexts, including reduction of the production of drug crops, nature conservation, citizen participation in urban development, and poverty alleviation.

At UNEP's 8th International High-level Seminar on Sustainable Consumption and Production, alternative economic development was discussed as an approach that treats natural resources and ecosystems as a collection of goods and services whose sustainable management brings about economic growth and increases human welfare over the long term. There was a focus on sharing experiences and identifying effective means and tools for governments to promote such alternative economic development, which will also be equitable.

The conflict between the long-term global interests of environmental protection and the immediate interests and (at times) urgent needs of economic development is a long-standing challenge. The following data are not new, but they demonstrate alarming trends.

Some economic growth trends
- The gross world product expanded nearly sevenfold between 1950 and 2001, when it reached US$ 46 trillion.
- World energy production rose 42% between 1980 and 2000. It is projected, under status quo conditions, to grow some 150-230% by 2050.
- Global primary aluminium production rose by 50% in the last ten years or so.
- Global paper production has more than tripled since the early 1960s.

Status of the environment
- During the 1990s a net 2.4% of the Earth's total forests was lost to deforestation.
- About 2 billion hectares of soil, equivalent to 15% of the Earth's land area (an area larger than the United States and Mexico combined), has been degraded by human activities.
- Around 70% of commercial fisheries is either fully or over-exploited.
- 400 million tonnes of hazardous waste is created from chemicals per year, of which 75% is attributed to developed countries.

Increased poverty
- 2.4 billion people lack access to basic sanitation.
- 1.1 billion people lack access to safe drinking water.
- Over a billion people live on less than $1 per day.
- Nearly a billion adults are illiterate.
- 11 million children under five die annually from preventable causes.

Economic development is urgently needed by the poor. Industrialization and urbanization are taking place at unprecedented speed, especially in large developing countries. Crucial goods and services provided by natural ecosystems to support development are diminishing, especially where the development is most urgently needed. There is no option but to work towards meeting development needs within the Earth's finite ecological carrying capacity. This will require a different kind of economic growth from that we have seen to date – one based on more efficient resource use and, wherever possible, circular flows of these resources within local, national and regional economies.

UNEP's approach: alternative development based on sustainable management of environmental goods and services (EGS)

Basic goods and services provided by the natural environment include water, land, energy, forests, a stable climate and mineral resources. They are essential to economic activities. These goods and services are especially crucial to regions at early stages of industrialization and urbanization. There is an urgent need to recognize and maximize the value and contribution of environmental goods and services (EGS) to development, in order to successfully address the often competing needs of environmental protection and economic development.

A range of strategies and tools can contribute to improving economic and social productivity on an environmentally sustainable basis. UNEP has been at the forefront of the development and promotion of many such strategies and tools (e.g. cleaner production, sustainable urban development, integrated waste management, sustainable finance, life cycle based approaches to sustainable consumption and production, and conservation based ecotourism development). However, these strategies and tools have yet to be widely recognized and/or applied in the mainstream development agenda. Their integration and application in the development field can be described as an "alternative development" approach.

The barriers to operationalizing alternative development approaches are due to:

- the perception that the strategies and tools focus only on environmental problems;
- lack of integrated understanding and communication links regarding the contribution that EGS make to economic and social development and human welfare;
- inadequate efforts to demonstrate practical approaches to (and the benefits of) sustainable EGS production and delivery.

UNEP DTIE has recently begun to develop projects and work programmes that demonstrate how economic and social development is supported by enhanced provision and more efficient use of environmental goods and services. Specifically, DTIE has recently integrated these strategies and tools into a project undertaken at the municipal level to demonstrate the needs and development benefits of applying such approaches.

In the context of this demonstration effort, the term "alternative development" refers to "environmental goods and services" (EGS) that include both physical natural resources, provided by the environment, and the various regulatory functions of ecosystems that contribute to economic activities and human welfare. For example, EGS includes water as a tangible good – a physical resource – as well as the services of water filtration and purification provided by natural vegetation covering watersheds. Environmental services could also include less tangible assets, such as the aesthetic or cultural value of natural landscapes, which nevertheless contribute to economic and social development.

Case study: Guiyang, China

China's Guiyang municipality is hosting a number of related demonstration projects that aim to establish a more sustainable pattern of development. This is an example of on-going efforts to develop alternative development approaches. The project is supported by the Chinese government (at different levels), international donors and UNEP.

As a backdrop, the Chinese government decided to promote the integration of resource productivity in social and economic development into the national strategy. This strategy, known by the term "circular economy", is an approach to achieving economic and social development with minimum input of natural resources or of costs to the environment. The concept, developed by environmental professionals, is based on closing the materials loop and on cleaner production. Reduction concerns the material and energy flows into the production and consumption process. Reuse concerns processing so as to prevent waste. Recycle concerns output. By turning wastes into secondary resources, wastes for final disposal can be reduced in volume and consumption of natural resources can be decreased.

The concept was developed in response to the increasing and almost unmanageable pressure put on the natural environment by rapid industrialization and urbanization in China.

The Chinese government has set a development target of a "well-off" (*Xiaokang*) society by 2020. This implies quadrupling gross domestic product between 2000 and 2020 and, in parallel, improving environmental quality, protecting natural resources and maintaining social progress. Given the current development path – which can be characterized as "high input, heavy pollution, low benefits, mass production, mass consumption, mass disposal and waste" – some experts estimate that the GDP goal may well lead to quadrupling negative impacts on natural resources and the environment.

The China State Environmental Protection Administration (SEPA) is now directly addressing the challenge presented by rapid economic development. It has had a pioneering role in the development and promotion of the circular economy approach. Currently, the concepts and practices of the circular economy have been applied in China at three levels:

- cleaner production in enterprises;
- industrial symbiosis in industrial parks;
- integrated resource based planning and policies for regional development.

The leadership role in developing the circular economy model rests with the National Development and Reform Commission (NDRC). NDRC has indicated that a circular economy will be promoted through legislative, political, technical and financial measures, including government subsidies and tax breaks.

UNEP initiated a project in December 2003 to complement the municipal government's efforts to develop a more sustainable economic development model. This project focuses on surveying, valuing and sustaining goods and services drawn from the environment that contribute to economic production.

Guiyang was selected because it is in the early stages of industrialization. Thus there is high potential for replicating the project elsewhere. In Guiyang:

- half the population lives on less than one dollar a day;
- economic growth is largely based on extracting and processing coal, phosphorus and bauxite resources, without any value enhancement;
- water and energy consumption per unit of GDP is several times the national average;
- economic growth in recent years is at 10.4%.

The Guiyang government is committed to the circular economy strategy for development. It is the only municipality that has developed a master plan for circular economy development, issued supporting local regulations, and implemented a number of related development projects. An intensive study provided a preliminary assessment of the sustainability of Guiyang's economic development model. **Figure 1** indicates the trends of economic growth and their relationship to resource consumption and pollutant emissions.

The assessment clearly highlights the need to change Guiyang's development path. A Circular Economy Office has been set up by the municipality to coordinate relevant efforts. It has also become the office for implementing UNEP's project in Guiyang.

One high-profile project of the Guiyang government is the development of a phosphorus and coal industry symbiosis system. The main features of this project include:

- government-facilitated industrial development to attract investment in the production of value added products – as many as 60 to 100 products are envisaged to be produced by the new industries (20% of the needed RMB 4.4 billion investment has already been secured);
- using modern technologies and a "symbiosis approach" to close material loops and maximize resource productivity, with up to 31% additional economic gain to be obtained;
- integration of township development with new industrial development to improve the infrastructure for both urban development and industrialization (this includes building roads and railways with government-industry partnerships);
- fostering responsible mining (joint government-industry mine site rehabilitation).

This specific project was recently identified by NDRC as a demonstration effort for an eco-industrial system.

The UNEP project combines tools that contribute to the development of a circular economy with others that sustain the provision of EGS and enhance the efficiency of their use. This will involve increasing awareness and understanding of the economic and developmental value of EGS, rewarding those who sustain and provide EGS, and ensuring that those who use them pay for them. Well established tools like cleaner production methods, the life-cycle approach, and a range of energy efficiency tools will contribute directly to more optimal use of EGS for development. This project at the municipal level takes place in the context of a broader national effort in China to develop a circular economy.

UNEP's project consists of two parts, both of which recognize and demonstrate the value of non-renewable natural resources and environmental goods and services in Guiyang. Experience with the project will ultimately be used to design and implement policies that maximize development gains made by sustaining the provision of these EGS. The two phases are:

- increasing resource use efficiency in existing production and consumption practices;
- fostering new and nature conservation based economic development.

Phase one

For the first phase (13 months) UNEP provided US$ 100,000 and the Guiyang government an additional US$ 115,000. The main activities are:

- to prepare a background study to assess and understand the development situation and scope of issues;
- to develop methodology for local government to assess and select development options;
- to demonstrate the economic gains from efficient use of resources through cleaner production practices in selected companies, and from raising public awareness of the benefits of sustainable consumption and production.

The study that resulted outlined the economic and social situation in Guiyang and the basic ele-

ments of the Guiyang Circular Economy Development master plan. These findings helped UNEP focus its project. Some of the main conclusions include:

- The landscape and diversified cultural composition are major assets for economic and social development. However, these assets are not capitalized to benefit the well-being of local people. If not carefully managed, these assets can easily be destroyed.
- The government plays a key role in economic development of Guiyang. The municipal government is very committed to sustainable development, but it lacks capacity in integrated policy-making, especially for market-based economic development.
- Mineral resource based industrial production is central to the local economy, but it needs to be balanced with development of the renewable resource based and service sectors.
- The basic capacity for market economy and industrial development (e.g. capital investment, infrastructure, human resources, technologies and management resources) is lacking.

The methodology component of the UNEP project aims to develop a tool to assess the sustainability of different economic and social development options. This tool consists of a basic set of indicators for measuring progress, and a procedure for evaluating and comparing options. The main indicators measure resource productivity and cover material flows and outputs, such as water, energy, material input and waste generation per unit of economic growth.

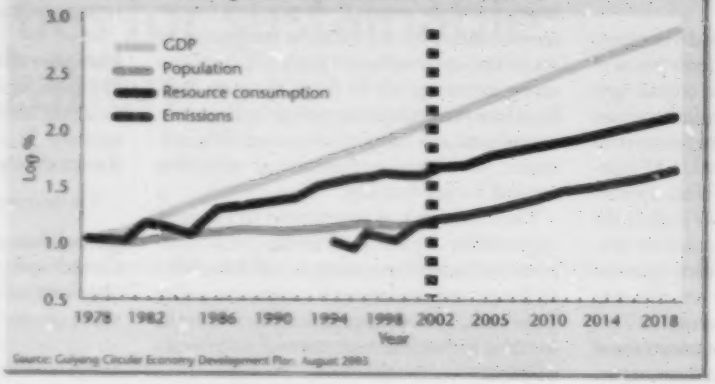
The study also emphasizes that nature conservation based economic development should play a more important role in Guiyang's development. Organic food, eco-tourism and herbal medicines are products that can potentially deliver economic growth, protect the ecosystem and cultural diversity, and alleviate poverty. Securing market access for the products generated, and developing "anchor" businesses, are keys to the long-term success of this approach.

The demonstration of cleaner production in three selected companies had encouraging results. Kelun Pharmaceutical Co. Ltd., a medium-sized private company that annually produces 100 million bottles of injection medicines, is an example. The demonstration project resulted in 14 cleaner production options to reduce emissions and material and energy consumption. The implementation of the options achieved the following reductions, per year:

- 80,000 m^3 of high sulphur content gas emission;
- 865 tonnes of solid wastes;
- 60+ tonnes of wastewater emission.

Total investment was RMB 7.133 million. The total direct economic benefit of reducing production costs was RMB 13 million, and this calculation does not include the cost savings from avoiding environmental damage.

Figure 1
Guiyang population, resource use, economic growth and pollution emissions 1978-2018



Source: Guiyang Circular Economy Development Plan, August 2003

Many awareness raising activities have been undertaken, as well. The project office published a set of public communication materials and organized an awareness campaign consisting of a mobile exhibition in towns and residential areas and on university campuses. A survey was conducted to understand the level of awareness for sustainable development and consumption behaviour. The results indicate that the circular economy initiative is well known, and that a significant portion of the urban population is concerned about environmental quality and economic development in Guiyang. Of those surveyed, 90% are pro-resource conservation in their households for economic reasons. However, there is very limited awareness of public participation in decision-making. The Guiyang government is making efforts to enhance public access to information about government policies and decisions in this regard.

Phase two: 2005 onwards

The second phase of the Guiyang project is two-fold:

- integrating government policy to support circular economy development in Guiyang;
- developing and implementing new policy tools, including price and market-based instruments, to recognize the value and sustain the provision of EGS (this includes fostering nature conservation based economic development of organic food, eco-tourism and herbal medicine).

The policy integration component was designed during the second quarter of 2004. It was submitted to the European Commission for funding under the Asia-Pro-Eco programme. EURO 500,000 has been approved. Implementation of this component is to start in March or April 2005 and to last for 18 months.

This component focuses on assisting the line departments of the Guiyang government integrate the circular economy strategy and master plan into the local policy-making process and the 11th five-year plans. The main activities of the project are to:

- identify and communicate priority areas and options for implementing the circular economy in Guiyang;
- build capacity in integrated policy-making through training, identification of policy gaps, and developing corresponding action plans within the framework of the 11th five-year plans;
- implement pilot policy interventions/modifications to demonstrate the role of policy guidance for alternative economic and social development;
- disseminate project results to other cities and develop train-the-trainer materials.

Internally, the project is undergoing a shift from a focus on production and consumption patterns to one on environmental goods and services that support production and consumption. In principle, all these EGS can be given an economic valuation, using a range of techniques. An initial step in phase two of the Guiyang project will be to quantify and value EGS, which currently support economic development and human welfare in the region. This will include EGS whose full economic potential has not yet been realized. These valuations will enable the local government to more clearly prioritize interventions to achieve more sustainable and efficient use of environmental goods and maintenance of environmental services.

The inventory and valuation will also enable the local government to identify and draw on currently under-utilized resources (e.g. those that could contribute revenues from tourism). Information about rates of depletion of environmental goods, and/or reductions or impairment of environmental services by economic activities, can then be used to indicate how these activities have to be designed or modified to be more sustainable. In some cases, information on depletion rates will also indicate where alternative economic enterprises will have to be found, now or in the future, to replace inherently unsustainable enterprises. "Unsustainable" in this sense means a case in which an economic activity will exhaust a physical natural resource, and/or is having a negative impact on environmental services that substantially reduces net human welfare and poverty alleviation gain from the activity.

The combination of an inventory of EGS, their valuation, and an understanding of how various economic activities deplete or otherwise impact upon them sets the basic framework within which project participants can design a sustainable (and in many cases circular) economy for Guiyang. This will be based on more efficient and sustainable use of the available EGS. The inventory of EGS and an assessment of their contribution to the productivity of each sector is the first step in developing an *integrated* set of policy measures, technological innovation and financial investment to deliver sustainability across the *broad range* of economic sectors and activities in Guiyang.

While this shift is very much desired, the knowledge base for the new focus must be further developed, requiring additional work beyond that

foreseen in the EC funded project. To inject the EGS concept and methodologies will require a parallel but integrated process, supported by additional expertise and funding.

The conservation based economic development component aims at promoting the development of market based local businesses in the organic agriculture, eco-tourism and herbal medicine sectors as a sustainable approach to restore ecosystem health. The project will benefit from UNEP experience enhancing the sustainability of other specific industry sectors. Such initiatives include the Tour Operators Initiative and its projects concerned with sustainable destination management, and the Retailers Initiative and its activities concerned with supply chain management.

The project will facilitate the development of "anchor" businesses in each of the three sectors, namely, organic food production and trading, ecotourism and herbal medicine production. Working closely with local authorities, the project will bring the necessary stakeholders together to create an enabling framework and reduce the risks, which would otherwise be too great for these business to extend their operations in Guiyang.

The project will build on DTIE's diverse experience in environmental technology, cleaner production, the life-cycle approach, the design and application of economic instruments for environmental protection, waste management, energy efficiency, and renewable and low carbon energy technologies. This experience will be applied in the context of sustaining the provision of EGS, and developing opportunities to add value to natural resources currently exported from the municipality in raw or relatively unprocessed forms.

At the completion of the two components of the Guiyang demonstration project, it is hoped that opportunities to enhance the contribution of environmental goods and services to economic and social development will have been clearly demonstrated. The project will also generate practical tools for local government to secure this objective, which can be replicated or modified for use in other communities and sectors.

The role of governments

Experience shows that alternative development efforts that integrate social or environmental issues can only be sustained when they are responsive to market forces. Effective integration of social and environmental goals still implies a strong supporting role for the public sector. Public-private partnerships can provide an important means to secure a balanced integration of the economic, social and environmental objectives required for sustainability.

The crucial role of government relates to its responsibility to protect and manage public commons and social development, as well as its ability to design and implement a supportive policy framework. The examples presented could not be sustained without the involvement of government, which can:

- identify hot spots (important social and environmental issues);
- set development targets;
- develop policy guidance harnessing market forces;
- initiate partnership projects and programmes;
- engage stakeholders and ensure public participation;
- facilitate knowledge sharing.

Conclusions: key issues and next steps

Alternative development approaches offer potentially powerful means to promote more sustainable patterns of consumption and production. Experience has shown that the following models, partnerships and outcomes have a critical role in achieving sustainability:

Circular economy

One of the core elements of "alternative development" is the application of the concept of "circular economy" which follows the three R principles (reduce, reuse, recycle). It can be applied at various levels of economic systems. This approach provides a convenient platform for applying proven concepts such as cleaner production at the enterprise level and industrial ecology at the regional level.

Governments and industry

Strong commitment by the local government and the active involvement of industries are vital to the success of alternative development approaches.

Multiplier effects

The application of alternative models can lead to economic benefits for industry and greater socio-economic benefits, including higher investment flows at the regional level.

The next steps are clear:

Consolidate and share experience

Compile and consolidate existing experience with alternative development models and replicate it where appropriate.

Integrate efforts into existing development frameworks

These frameworks would include "city development strategies" and "national poverty reduction and sustainable development strategies" or loan efforts from donors or lending institutions. This could also include expanding the capacities and services of existing institutions, such as NCPCs, to provide services that would positively influence regional and national development planning processes.

Integrated assessment capacities

Capacities for integrated assessment of sustainable development policies and strategies at the regional and national level should be enhanced.

Multi-stakeholder participation

The engagement of the private sector in multi-stakeholder efforts to promote sustainable consumption and production at different levels should be strengthened.

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Alternative development models: opportunities for sustainable industrialization

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Summary

There is a need for increased collaboration and partnerships across countries and among governments, business and civil society. This article considers how SCP awareness and perspectives could help focus action where it would be most effective, exploit opportunities for development that better integrate environmental and social (as well as economic) progress from the outset, and encourage bilateral and multilateral, multi-stakeholder collaboration and partnerships of mutual benefit to both developed and developing countries.

Résumé

Il est indispensable de développer la collaboration et les partenariats entre pays et entre les gouvernements, les entreprises et la société civile. Cet article s'intéresse au rôle que pourraient jouer des modes de consommation et de production durables pour focaliser l'action là où elle serait la plus efficace, pour exploiter les possibilités de développement qui intègrent d'emblée le progrès environnemental et social (et économique) et pour encourager la collaboration et les partenariats multipartites bilatéraux et multilatéraux dans l'intérêt à la fois des pays développés et des pays en développement.

Resumen

Es necesario intensificar la colaboración y las alianzas en el interior de los países y entre los gobiernos, las empresas y la sociedad civil. Este artículo analiza la forma en que la sensibilidad y las perspectivas de CPS podrían contribuir a canalizar las acciones a los espacios donde resultarían más efectivas, aprovechar las oportunidades para el desarrollo que mejor integren el progreso ambiental y social (además de económico) desde el principio, y propiciar la colaboración bilateral y multilateral entre múltiples actores y alianzas de beneficio mutuo para los países desarrollados y los países en desarrollo.

The challenge of achieving sustainable consumption and production (SCP) has been the focus of attention for many years. For example, together with poverty eradication it was a cross-cutting theme for the work of the Commission on Sustainable Development (CSD) in the five years leading up to the World Summit on Sustainable Development (WSSD) in Johannesburg. There has been progress in many areas of the broad SCP agenda, such as cleaner production. However, as reflected in the discussions and outcomes of WSSD, much still needs to be done.

The international community agreed in the Johannesburg Plan of Implementation (JPOI) to "develop a ten-year framework of programmes in support of regional and national initiatives to accelerate the shift towards sustainable consumption and production [in order] to promote social and economic development within the carrying capacity of ecosystems by addressing and, where appropriate, delinking economic growth and environmental degradation through improving efficiency and sustainability in the use of resources and production processes, and reducing resource degradation, pollution and waste."

The JPOI called on developed countries to take the lead, reflecting historical and prevailing patterns of resource use and consumption and their impacts, particularly on the environment. However, as reflected in the range of regional and other activities since WSSD in support of the Marrakech process (launched at the international expert meeting hosted by the Government of Morocco in June 2003), the SCP challenge is relevant to all countries.

Shifting to more sustainable consumption and production (SCP) patterns demands:

- a whole life-cycle perspective;
- integration of SCP thinking in a wide range of policies and decisions;
- ensuring close links between domestic and external policy-making.

Progress at the global level: the importance of partnerships and bilateral cooperation

The complex global, trade-related networks that are a feature of globalization are the focus of much debate and controversy. They also offer major opportunities and potential to embed sustainability. Investment and supply chain relationships provide avenues for helping identify where major impacts are located, focusing action and encouraging sustainable industrial development, with high environmental and social standards built in from the start.

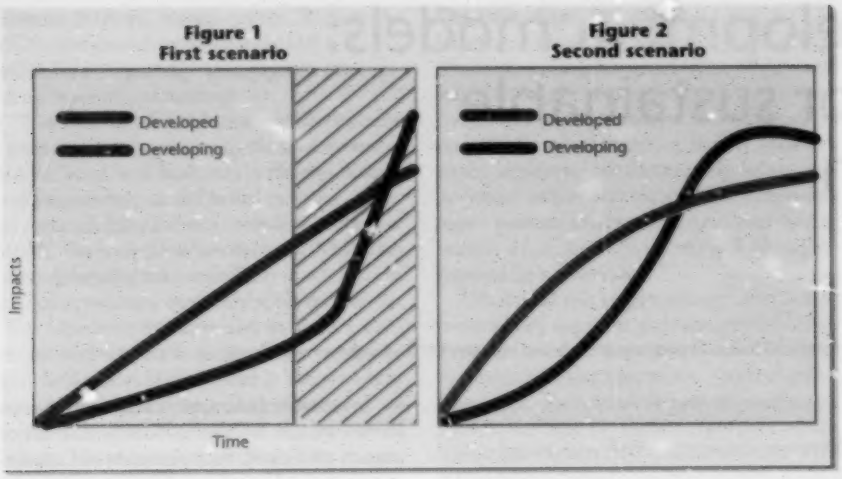
At the policy level, a wealth of experience has accumulated in the EU and North America on the maturing environmental agenda, with lessons from both successes and failures. There are mutual benefits to "exporting" those standards and lessons. Realizing the benefits means overcoming many hurdles and deeply held concerns about the risks of protectionism, unfair competition, and the abuse of disparities in market and political power.

Progress at the global level, on a consensus UN basis, is essential but will necessarily be slow and short of the "state of the art". Business has a critical role in finding and, in particular, implementing innovative and practicable solutions to SCP challenges. In responding to change and applying new ways of looking at things, entrepreneurial risk-taking culture also makes the private sector more nimble than governments can usually manage to be. Civil society groups can help ensure action that is both sensitive to, and directly responsive to, local needs and circumstances. This all underlines the importance of partnerships and bilateral cooperation.

Flexible groupings of government, the private sector and civil society can more easily stimulate and exploit opportunities for change. And more narrowly focused sectoral and other approaches can help ensure better designed and more effective action.

We live in a fast-changing and ever more interconnected world: a world of increasingly complex networks of governmental, business and civil society relationships enabled by developments in information and communications technology (ICT), trade and transport and spanning national borders. The consequences and implications of increased globalization and a growing world economy continue to be the focus of much debate, with widely differing views about the sustainability of current trends. While distances have been shrunk by these technologies, gaps between the richest and poorest within and between countries have grown.

On one hand, there are concerns that globalization is magnifying the adverse environmental and social impacts of current production and con-



sumption patterns, that these impacts fall disproportionately on developing countries, and that they are more than the planet can sustain. On the other hand, fuller integration of more countries in the global economy has produced significant benefits in terms of, for example, the creation of jobs and wealth to tackle poverty and improve quality of life, as well as facilitating more rapid and effective technological development.

One practical consequence of globalization is that the distribution of the environmental, economic and social impacts – good and bad – of consumption and production has become increasingly complex and widely spread geographically and across the whole life cycle. Major impacts are increasingly located far from final consumption. From food to manufactures such as consumer electronics, our consumption is increasingly delivered through (and our production supplied into) global networks.

Manufactured items like cars or laptops increasingly contain components produced in many different countries from materials extracted and processed in others, with use and final disposal bringing more places into the chain. There will be a wide range of economic and social, as well as environmental, impacts at each stage, varying in their significance individually and in aggregate, whether in terms of location, medium or contribution to sustainable development. Rapid growth means many more decisions are being made more rapidly that can either enable SCP or lock in obstacles. How can those decisions be influenced in the right direction?

Global consumption and production patterns: two scenarios

Questions about the current and likely shape and consequences of global patterns of consumption and production are at the heart of debates about what needs to done in order for development to be sustainable from the global to local levels. For purposes of analysis, the many different perspectives might be concentrated in the two scenarios below. These are rough broad-brush scenarios, not predictions.

The first scenario (**Figure 1**) reflects a number of broad assumptions:

- the economies of developed countries will continue to grow;
- there will be faster growth across developing and emerging economies;
- this growth will be patchy, with continued very rapid growth, in countries like China and India, but negligible or worse in other countries, especially in sub-Saharan Africa;
- the developed country market economy model of recent decades is the all but universal template;
- there will be incremental eco-efficiency gains, but in the absence of radical change and step-change improvement, and on a scale that falls far short of absolute increases in consumption of resources, in themselves magnified by the size of the populations of the countries growing most rapidly and the distance to catch up with standards of living taken for granted as the norm in the north;
- the aggregate adverse impacts of developing countries catch up with and overtake those of the developed countries;
- but at some point (represented by the vertical line), and possibly before that happens (the uncertainty represented by the shaded area), the planet is unable to absorb the impacts, with ensuing crisis as natural systems irretrievably break down.

The second scenario (**Figure 2**) is based on other assumptions:

- there is absolute decoupling of environmental degradation from growth and economic and social development;
- the developed economies gradually turn the corner on decoupling, but this happens even more quickly through sustainable industrialization in developing countries;
- in addition to incremental improvements, competition and innovation enable step-change improvements in use of resources;
- innovations are most rapidly applied and increasingly developed in developing countries, as the investment (in human and physical capital) in which rapid (but more evenly spread) growth is grounded has sustainability and SCP built in from the outset;
- all this is achieved within the carrying capacity of the planet.

Is this second scenario in any way realistic and achievable? Experience would strongly point to the most likely outcomes being variations on the first scenario.

Is the second just a utopian illusion? The focus on action in and benefits to developing countries could be seen as inconsistent with the WSSD commitment by developed countries to take the lead, and as shifting attention away from the responsibilities of developed country businesses and consumers. And if it might be theoretically possible, what needs to be done and what obstacles need to be overcome to make it a practicable proposition?

Looking at alternative development proposals through an SCP lens

Changing Patterns – the UK Government Framework for Sustainable Consumption and Production, published in September 2003 (www.dti.gov.uk/sustainability/scp/index.htm), set out the UK policy approach to SCP, including attention to:

- stimulating innovation – technological, social and institutional;
- making markets work for sustainable consumption and production;
- the need to apply a "toolbox" of instruments;
- seeking the best life cycle result;
- dealing with problems as early in the life cycle as possible;
- integrating SCP across policy-making.

In a globalized world, all these elements have as many external as domestic implications and need to be considered together in a holistic life-cycle perspective. Even within particular parts of the cycle, such as production or end of life, we have experience of the risks of narrowly considered regulatory or other action that, in dealing with one problem, closes off benefits elsewhere (malaria vs. environmental concern about DDT), merely shifts the problem (e.g. sewage impacts between different media) or unintentionally causes other problems (e.g. burdens of compliance with essential consumer safety measures that SMEs or developing country producers cannot meet).

Looking through an SCP lens, with an understanding of the nature, scale and location of all the impacts (economic, environmental and social), can help ensure consideration of the wider implications and identify where best to focus any interventions and the best form they should take to secure effective action while avoiding unintended adverse consequences. But will we ever have a sufficiently robust and comprehensive level of understanding, and also be able to find a way through the complexity and competing objectives and interests?

Almost certainly not on both counts. The complexity of global supply chains means that it is like trying to measure the shapes seen through a moving kaleidoscope, and reliable assessment of many of the impacts (whether the value of a particular species or ecosystem or the benefits to poverty eradication from a mining project or production plant) is very difficult and perhaps impossible. And our understanding of the physical limits of the planet to sustain current and future activities remains very imperfect. But that does not mean it

is futile to try, or that any attempt to prioritize can only be based on the vagaries of what will grab the attention of key decision-makers – usually short-term paybacks, whether in terms of financial, political, physical or emotional returns.

Although still very imperfect and often subject to polarized interpretations, over recent decades our understanding of what sustainable development means and requires has improved in many areas. Techniques like life-cycle and sustainability assessments, improvements in observation and measurement technologies and modelling possibilities, processes like integrated pollution prevention and control (IPCC), and initiatives and research in areas like forests and fisheries are accumulating knowledge and understanding. In increasing areas, like illegal logging and mining, enough is known to confirm the need for action but also to provide a reliable foundation for identifying the roles of different players and the decisions that need to be influenced.

The development of such techniques has broadly tracked and mirrored the growth and increasing sophistication of environmental and progressively sustainable development policy. This has largely been driven from North America and Europe, which also set the pace in progressively more demanding standards of environmental performance, with impacts that extend beyond national frontiers.

As the agenda has extended beyond major industrial point sources of pollution to challenges such as climate change and SCP, and has been better integrated with a wider sustainable development perspective, many lessons have been learned by experience. These include the limitations of simple command and control models, and also the strengths and weaknesses of alternative and complementary tools. One clear lesson is that even when attracting widespread support, including by policy-makers themselves, innovations in policy have proved slow and difficult to put into practice. And in contrast to the exponential rates at which innovations in areas like communication and labour-saving have been applied, the take-up of cleaner technology has often been slow.

Some of this reflects lack of awareness of the possibilities, or a focus on opportunities for higher and faster returns in cost-saving or revenue generation. But it also reflects stages of development, capital cycles, the degree to which behaviour is "locked in" to particular technological, social and cultural conditions, and the degree of retrofitting required. The cost disincentives of adapting physical plant or equipment obstacles can also arise from other factors such as legal or administrative practice. For example, switching from, say, the supply of vehicles to providing a transport service, or from supplying chemicals to a fabric treatment service might not easily fit prevailing practice with respect to employee or product liability, environmental regulation or tax treatment.

Integrating environmental concerns and sustainability

Different countries have moved through stages of development – from the primacy of agriculture to growth of heavy industry and migration to high tech and services – at different times, adopting different models of industrialization. But the pace of change has increased and periods of transition have been greatly shortened. Developments from the origins of the industrial revolution in the UK, through the Ford assembly lines and lean production techniques pioneered in Japan have left legacies in physical infrastructure and contamination, as well as social/cultural challenges and practices that inhibit change. However, unlike the situation facing developing countries embarking on or making these changes now, environmental concerns and sustainability have not historically been drivers or influences on those developments.

They need to be integrated today. Sustainability concerns need to be an automatic part of the process, with access to the knowledge and capacities to deal with them successfully exploiting the opportunities for improved efficiency and those from growing market attention to environmental and social performance. Global trading networks provide channels for bringing developed country standards and expectations to bear on developing countries, but, as discussed above, they also provide avenues for facilitating innovative development that learns from the lessons of past models and promotes sustainable industrialization.

Realizing this potential involves many of the most complex, difficult and contentious issues for the international community in trade, development and environmental policy. In particular, bearing in mind the patchy record of developed countries in putting sustainability into practice, there is understandable concern and suspicion about developed country motives and priorities in pushing the sustainable development and SCP agenda, and the consequences for their needs and priorities. Equally, there are understandable concerns in developed country businesses and among their employees and communities about invest-

Kawasaki's eco-industrial revolution

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Kawasaki City, just south of Tokyo, has a population of 1.3 million. Kawasaki was a small town when Japan opened itself to the west in the late 19th century. Since then, industries including steel, oil refining, petrochemicals, cement, paper, power production and metallurgy have been introduced. The companies running those plants undertook very aggressive operations.

Kawasaki has been the basic engine of Japan's economic development for decades, particularly during the last half century. In the process of economic expansion and development, however, its environment was rapidly polluted by expanding industrial activities. This phenomenon was very evident in the 1960s and 1970s, when Kawasaki City became known as a "polluted city". Many citizens suffered from the effects of air pollution, resulting in serious social and political problems.

In the 1990s, when the economic bubble burst, all traditional heavy industry in Kawasaki experienced serious economic depression, scaling down production, restructuring, or laying off workers. However, this was also the period in which the necessity of addressing global warming (in other words, reducing greenhouse gas emissions and improving energy efficiency) became apparent. Both the private and public sectors began to address this issue: the central government introduced the concept of the "circular economy" or "recycling-based society", with legislation aimed at promoting recycling in Japan

Under these circumstances, heavy industry in the Kawasaki Coastal Area searched for ways to survive by applying its production methods to waste disposal and recycling. For example, at a steel plant new technologies were developed to recycle waste plastics as raw material and blast furnace fuel. At a petrochemical plant, waste plastics began to be used as raw material to produce ammonia as a final product.

In the process of developing new technologies to survive, Kawasaki's industry also found sensible solutions that could improve the quality of the city's environment.

The Kawasaki City and national governments played vital roles in creating and implementing these solutions. They enacted laws and formulated measures that, although later than the companies' initiatives, have stimulated their efforts.

I would like to emphasize two important directions in the efforts of both the national and Kawasaki City governments: *appropriate waste disposal and recycling, and reducing CO_2 emissions and raising energy efficiency.* Companies have made efforts to comply with governmental measures and policies. At the same time, they have improved their financial situations.

In addition to companies in the Coastal Area, high-tech industries are located in the inland part of Kawasaki. These industries have endeavoured to develop highly eco-efficient production methods and to disseminate products that are environmentally sound during use.

What has been happening in Kawasaki shows that the "eco-industrial revolution" is under way. Kawasaki City is continuing to evolve, becoming an information base that will diffuse the city's experiences and technologies to other parts of the world.

ments and other actions that improve the competitiveness of developing country rivals.

It will be a major challenge to overcome these concerns and exploit the potential for action that produces mutual benefits, such as technical assistance to support access by developing country producers to developed country markets for more environmentally and socially acceptable products, and expanded choice for developed country consumers. The complexity and sensitivity of the issues involved means that it is unrealistic to expect rapid progress at a multilateral level. Certification and other initiatives on timber and fisheries suggest that more narrowly focused stakeholder partnerships can develop innovative and flexible approaches that exploit common interests rather than getting stuck on differences. Similarly, bilateral governmental cooperation and sectoral approaches can provide greater space for innovation and risk-taking than more comprehensive multilateral approaches.

Like much of the preceding, discussion policy attention and experience to date has tended to be concentrated on the production phase. Much progress has been made in improving energy and materials efficiency, and more is needed. However, improved understanding of life-cycle impacts in increasingly globalized markets, and the places where decisions need to be influenced to move towards SCP, suggest a need for more attention to the consumption phase, as well as better integration of SCP thinking in the design of goods and services.

UNEP can play a key role in these areas, as well as encouraging a favourable environment for innovative collaborations, from work in promoting awareness and understanding of SCP and the consequences of failure to transform unsustainable patterns, to convening and exploiting networks and disseminating best practice. ◆

The introduction of MMT in South Africa: uncertainties associated with implementing the precautionary approach and the precautionary principle

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Summary

Sasol, a multinational petrochemical company based in South Africa, undertook to implement what can be seen as a precautionary approach when it introduced the fuel additive MMT as an alternative to lead in petrol. This approach included assessing alternative options, entering into dialogue with external stakeholders, and undertaking ongoing research and monitoring. While companies like Sasol that have signed on to the Global Compact are committed to implementing a precautionary approach, this article concludes by suggesting that the full implications of such a commitment (even if it is not as ambitious as commitment to the precautionary principle) may not have been sufficiently appreciated by the corporate community.

Résumé

Sasol, compagnie pétrochimique multinationale basée en Afrique du Sud, a entrepris de mettre en œuvre ce qui peut être considéré comme une démarche de précaution lorsqu'elle a remplacé le plomb par du MMT comme additif dans l'essence. Elle a notamment évalué les autres options possibles, instauré le dialogue avec les parties concernées extérieures et institué des activités permanentes de recherche et de suivi. Si des entreprises comme Sasol se sont engagées, en signant le Pacte mondial, à adopter une démarche de précaution, il se pourrait que toutes les implications de l'engagement de Sasol (même s'il n'est pas aussi ambitieux que l'engagement d'appliquer le principe de précaution) n'aient peut-être pas été évaluées à leur juste valeur par l'ensemble des entreprises.

Resumen

Sasol, una empresa multinacional petroquímica con sede en Sudáfrica, ha aplicado lo que puede considerarse como un enfoque preventivo al introducir el aditivo MMT como alternativa al uso de plomo en gasolinas. El enfoque incluye la evaluación de opciones alternativas, el diálogo con actores externos y medidas continuas de investigación y monitoreo. Si bien las empresas que, como Sasol, han firmado el Pacto Mundial y se han comprometido a adoptar un enfoque preventivo, este artículo apunta que la comunidad empresarial podría no haber sopesado cabalmente las implicaciones de dicho compromiso (aun cuando éste no sea tan ambicioso como el compromiso con el principio preventivo).

As a signatory to the UN Global Compact, the South African company Sasol is committed – in terms of Principle 7 of the Compact – to "support a precautionary approach to environmental challenges." As part of this commitment, the company agreed to develop an independent Global Compact Business Case Study to review its implementation of Principle 7 in the context of its activities related to the introduction of the fuel additive MMT in South Africa. This article is substantially based on that Case Study, which is available from the UN Global Compact website.[1]

There is an important conceptual difference between the more widely accepted precautionary *approach* and the more stringent precautionary *principle*. This article explicitly focuses on the latter, with reference to the Sasol Case Study.

At a general level, the precautionary principle may be seen to demand higher levels of precaution than the precautionary approach. This difference is demonstrated by the extent to which, in the negotiation of various multilateral environmental agreements, certain negotiating blocs (traditionally the JUSCANZ countries, i.e. Japan, the US, Canada, Australia and New Zealand) have strongly opposed the precautionary principle while accepting reference to the precautionary approach.

The precautionary principle demands that precautionary action be undertaken in instances where there are credible threats of harm to human health or the environment, notwithstanding the existence of residual scientific uncertainty about cause and effect relationships. Its strict application places an obligation on the proponents of particular activities to take a risk-averse approach when there is credible evidence that these activities may be harmful, even if the nature of that harm is not fully understood.

Implementation of the precautionary principle is seen by its advocates to be fundamentally different from the more traditional approach to environmental decision-making that relies primarily on the use of risk assessments. According to advocates of the precautionary principle, the traditional risk-based approach to decisions asks: "How much harm is acceptable?" or "How much harm can we get away with?" The newer precautionary approach asks: "How much harm can we avoid?" The difference between these approaches is profound.

The phase-out of leaded fuel in South Africa

For decades, refiners have added tetraethyl lead (TEL) to petrol as a cost-effective means of increasing octane. TEL also provides engines with lubrication benefits and prevents valve seat recession in older vehicles. There are, however, numerous recognized health concerns regarding lead, in particular that it impairs brain function development in children and contributes to cardiovascular disease and premature mortality in both adults and children. Concerns have also been raised that leaded fuel is the largest source of exposure to lead in most urban areas, estimated to account for up to 90% of airborne lead in some cities in developing countries.

As a result of these concerns, there has been a growing move internationally to phase out leaded fuel. South Africa has committed to phasing it out by 2006. Unleaded fuel was first introduced in South Africa in 1996, primarily to meet the needs of imported vehicle technology. In 2000, to promote greater market penetration, Sasol introduced MMT – a cost-effective but controversial octane improver – as an additive in their refinery process for unleaded petrol.[2]

Sasol's initial decision to introduce MMT was based on a detailed examination of alternative non-lead octane boosters, as well as on a separate techno-economic study. Recognizing that there were some concerns and uncertainties regarding MMT, and notwithstanding the fact that it had been approved for use in some OECD countries after extensive tests, Sasol undertook to follow a transparent process with the aim of ensuring its responsible introduction into the South African market.

This decision was taken in the absence of any legal guidelines or requirements on fuel additives, and was the first time that such a consultative route was followed in South Africa with respect to the introduction of a fuel additive.

The precautionary principle: practical implications

When an activity raises threats of harm to human health or the environment, precautionary measures should be taken even if some cause and effect relationships are not fully established scientifically. In this context the proponent of an activity, rather than the public, should bear the burden of proof. The process of applying the Precautionary Principle must be open, informed and democratic and must include potentially affected parties. It must also involve an examination of the full range of alternatives, including no action. – **Wingspread Statement, 1998**[3]

Building on the above definition, as well as on the approach adopted in the European Commission's Statement on the Precautionary Principle (2000), implementation of the precautionary principle could be seen to encompass the following five broad sets of activities:[4]

1. The first step is to assess whether in fact the precautionary principle should be invoked at all. This requires that the potentially negative effects of the proposed activity are identified, and that the scientific data relevant to these risks are evaluated. The precautionary principle is only invoked when, due to the insufficiency of the data or their inconclusive or imprecise nature, it is impossible to determine the risk in question with sufficient certainty, and where there is an indication that the possible effects on the environment or health may be potentially dangerous. Once it has been decided on the basis of this evaluation that the precautionary approach is required, then it is suggested that the following precautionary activities should be implemented:
2. undertaking an assessment of all the alternative options, noting the environmental, health and economic costs and benefits of each approach, with the burden of proof of "harmlessness" shifting to the proponent of the proposed activity;
3. adopting a transparent, inclusive and open decision-making process that involves all interested parties in the study of the various risk management options;
4. implementing an ongoing process of research and monitoring, with decision(s) periodically re-examined based on any new available information, and with early preventive action being implemented in response to any reasonable suspicion of harm;
5. implementing the proportionality principle, such that the costs of action to prevent hazards are not disproportionate to the likely benefits in both the short and long term.

Sasol followed each of these proposed elements in its approach to phasing out unleaded petrol.

MMT: a case for invoking the precautionary principle?

If there are seen to be credible threats of harm, notwithstanding the existence of residual scientific uncertainty, the precautionary principle demands that precautionary action be undertaken.

As part of its overall assessment of alternatives to leaded fuel, Sasol carried out an initial techno-economic study of MMT which indicated that it was a desirable option. A separate additional review of international experience with MMT highlighted that while its use was technically acceptable, it was nevertheless a controversial option, with international motor manufacturers and various environmental health NGOs campaigning against its use. Recognizing this controversy, Sasol's international review included a detailed analysis of US EPA court cases involving approval of MMT (1995) and the Government of Canada's decision to continue to allow MMT use (1998). Recent government approvals in other countries were also examined.

International experience may be seen to constitute an adequate basis for a "reasonable decision" based on "sound science". Nevertheless, for some parties there remained sufficient uncertainty and cause for concern to invoke the precautionary principle and to avoid using MMT pending further clarity. A number of South African and foreign organizations and individuals maintained that further studies on the health and environmental impacts of MMT were required, and that the burden of proof should be on the suppliers of the fuel to show that such harm is not caused.

There are some strongly diverging perspectives on the application of the precautionary principle in the context of MMT. These differences raise some important and potentially difficult questions for corporate decision-makers in determining whether or not it should be invoked:

At what stage is the available scientific information no longer deemed to be "insufficient, inconclusive, or uncertain" (in the wording of the European Commission position paper)?

What actions are required by the proponent of the activity to provide assurance of this? And how feasible is it to provide sufficient data that something is *not* a threat?

How does one judge an "acceptable" level of risk for society? And who should judge this?

Recognizing these uncertainties, Sasol undertook to implement what may (arguably) be seen as a precautionary approach. This included assessing alternative options, entering into dialogue with external stakeholders, and undertaking ongoing research and monitoring.

Assessing alternative options

Since the early 1990s, Sasol has examined possible alternative non-lead octane boosters. While each alternative is deemed to be better than lead in terms of impacts on health, each has its own specific drawbacks. For example, while organic compounds such as aromatics and other ethers are an option, there are concerns that resulting higher benzene emissions may increase risks of cancer and water contamination. Similarly, while increased ethanol blending has been successfully used in Brazil, various concerns have been cited regarding the economic feasibility and technical merits of a transition to more widespread ethanol use in South Africa. And while alternative metallic additives to lead (such as MMT) can be used, there are concerns about their possible impacts on health and on automotive equipment.

The process of stakeholder consultation

Sasol stated that it was committed from the outset to follow an inclusive and transparent process regarding the introduction of MMT in South Africa, notwithstanding the fact that there was no regulatory requirement for stakeholder participation.

The stakeholder consultation process involved identifying critical stakeholders, ascertaining their attitudes to the proposed introduction of MMT and responding to each concern identified. In a number of instances, this resulted in new commitments by Sasol regarding MMT use. The identified stakeholders comprised various government departments, oil companies, motor vehicle manufacturers and marketers, fuel retailers, motorists, the media and the Legal Resource Centre. The stakeholder process was valuable not only in ensuring responsible implementation of the decision, but also in obtaining internal alignment within Sasol and providing greater awareness of the potential risks involved.

During the consultation process, and largely in response to the identified concerns, Sasol undertook to meet the following new commitments:

- to limit the use of manganese to a maximum of 18 ppm in unleaded petrol that may contain 13 ppm lead (as compared with 400 ppm in the leaded petrol that it replaces);
- to undertake a baseline study of personal exposure to airborne manganese before introducing MMT; this was undertaken by an expert third party, using an approach similar to that used in Canada, the UK and the US as required by their regulatory authorities;
- to employ an independent expert to undertake a repeat monitoring study comparable to the baseline study one year after introduction of MMT, in order to establish whether the risk assessment and international experience are valid for South Africa;
- to biannually review the dosage level and possible corrective action based on objective and meaningful criteria for the SA situation;
- to compensate for any vehicle problems that may arise specifically due to the use of petrol with MMT, in so far as it differs from typical South African fuel without MMT;
- to withdraw MMT if it is proven to be a cause for concern.

Other Sasol assessments

In addition to implementing the above commitments, a number of which were aimed at further identifying and/or reducing any potential risks associated with MMT use, Sasol undertook the following measures on its own initiative:

- an independent environmental health risk assessment of MMT use in South Africa (this was completed before the stakeholder consultation process commenced);
- an environmental impact assessment for the installation of the dosing facility at the Sasol refineries, covering the handling of MMT and its dosing to petrol;
- various exhaust gas emission tests in which petrol containing MMT was compared with typical current unleaded petrol.

Reviewing the process: was Sasol's approach consistent with the precautionary principle?

On the basis of this summary of Sasol's activities, and bearing in mind the above outline of the activities encompassed in implementing the precautionary principle, Sasol's approach to introducing MMT could be considered to be in accordance with the key tenets of the precautionary principle.

Having decided that there was reason to adopt a precautionary approach – this despite indications from the international review that there was (arguably) already a compelling basis for safely using MMT – the company implemented a process of public consultation that impacted on the decision-making process, resulting in a number of new commitments. However, it could be considered that these activities are not sufficient to constitute meaningful implementation of the precautionary principle. Critics of MMT have insisted that there are still too many uncertainties and that steps should be taken to prevent "introducing a potential neurotoxin into a very efficient delivery system, automobiles"[5] without first proving that MMT will not cause harm.

Questions have also been raised regarding the nature and timing of the stakeholder process. It has been suggested that in terms of the strict application of the precautionary principle "The involvement of stakeholders… needs to begin at the beginning rather than being artificially confined to the later 'risk management' stages of the conventional approach. The stages of hazard and risk appraisal, management and communication are not sequential, as in the traditional model, but require stakeholder involvement at the earliest stage."[6] In this regard, there may have been scope for Sasol to start its consultations earlier in the decision-making process.

To counter suggestions that the full extent of the precautionary principle might not have been applied, Sasol and others have drawn attention to issues associated with the *proportionality* principle, in terms of which "the costs of action to prevent hazards should not be disproportionate to the likely benefits in both the short and long term".[7] Implementation of this principle should include consideration not only of the potential financial and social costs associated with the alternatives, but also the costs associated with *not* implementing the chosen option.

A relevant consideration in this regard is the fact that Sasol's decision to use MMT resulted in an immediate 15% increase in the use of unleaded petrol, with an ensuing significant reduction in the concentration of heavy metals. It has been argued that the extent to which Sasol's decision contributed directly to more widespread phasing out of leaded fuel, particularly in the context of a lack of economic incentives, should be seen as one of the principal benefits in any "cost-benefit" assessment of alternatives.

Advocates of such a response may be tempted to argue that "to deny consumers the benefits of innovative, beneficial products while forcing companies to prove the impossible – that their product is completely safe and absolutely risk free – is a prescription for disaster"[8] Other, more cautious observers may, however, wish to recall the experience of CFCs, once praised for the significant benefits they were seen to deliver with lower risk than current alternatives.[9]

Lessons learned and unanswered questions

As this brief review has hoped to demonstrate, companies seeking to implement the precautionary principle as part of any decision-making process are likely to be faced with several difficult (and at times controversial) decisions.

In the first instance, it is often difficult to decide whether or not the precautionary principle should be invoked. As outlined earlier, this raises a number of potentially awkward questions. At what stage can one assume that the available scientific information is no longer "insufficient, inconclusive, or uncertain"? What actions are required by the proponent of the activity to provide assurance of this, and how feasible is it to provide sufficient data to show that something is *not* a threat? In assessing whether the principle should be invoked, how does one judge what is an "acceptable" level of risk for society? As the European Commission puts it, this is an "eminently political responsibility" and thus presumably in the purview of government rather than the individual corporation.

This, in turn, raises the question of the extent to which the individual company – in applying the precautionary principle – can reasonably be expected to take a leadership role in making any required judgements in the absence of any decision from government, and in the context of "positive" findings from an independent and transparent risk assessment process, particularly when there are potential conflicts with commercial interests. In what circumstances (i.e. under what level of uncertainty) is it reasonable or feasible to expect a company (in the absence of government) to move beyond the suggested positive findings of a risk assessment?

The adoption of an open and transparent stakeholder process forms a critical component of implementing the precautionary approach. An important question raised by this study relates to the stage in the decision-making process at which stakeholders should be engaged. Some have suggested that meaningful implementation of the precautionary principle would have required an earlier engagement of stakeholders. Others have maintained that in the context of Canada's approval of MMT based on an exhaustive personal exposure study, as well as from a pragmatic business perspective, Sasol's approach may be seen as sufficiently precautionary.

Finally, an observation made by a number of participants in this initiative is that the precautionary principle may be invoked for purely political and/or commercial interests rather than with a genuine desire to minimize risk to the broader community. With the aim of promoting a more effective and "bias-free" decision-making processes, it has thus been suggested that each of the various claims and counter-claims should be assessed

and evaluated on the same basis. Comment by interested parties on the submissions of other stakeholders should be facilitated, and full access should be provided to the other stakeholders' data and testing methodology. Ideally, there should be independent peer review of any claims and counter-claims, with minimal reliance on the use of anecdotal submissions.

Concluding thoughts

At the 2003 meeting of the World Economic Forum in Davos, Switzerland, the annual gathering of the world's business leaders, three priority challenges facing the business community were identified:

- rebuilding trust in corporations;
- dealing with systemic risks (such as global climate change, terrorism and HIV/AIDS);
- promoting sustainable development.

If business leaders are to respond meaningfully to each of these challenges, and demonstrate leadership in doing so, then they will need to grapple with understanding and implementing the precautionary principle. Appropriate implementation of a precautionary approach is fundamental to rebuilding trust, it underlies efforts to deal with systemic risk, and in many instances is a critical component of promoting sustainable development.

As this article has sought to demonstrate, implementation of the precautionary principle may result in difficult questions being asked of corporate decision-makers. Hundreds of companies globally have signed on to the Global Compact, thereby ostensibly committing themselves to implementation of a "precautionary approach". Although admittedly less ambitious than a commitment to the "precautionary principle", it is nevertheless questionable whether the full implications of such a commitment have been sufficiently appreciated by the corporate community.

Notes

1. www.unglobalcompact.org (Learning, Case Studies).
2. Methylcyclopentadienyl manganese tricarbonyl (MMT) is an organic manganese compound fuel additive used to boost octane levels in petrol and diesel fuels. Developed by Ethyl in the 1950s to reduce common engine knock in automobiles, it has been used in leaded and unleaded petrol for more than 30 years and for more than 25 years, respectively.
3. The Wingspread Statement on the Precautionary Principle is the outcome of a two-day meeting of an international group of scientists, government officials, lawyers and labour and environmental organizations who met in 1998 in Wisconsin, USA (see www.gdrc.org/u-gov/precaution-3.html).
4. Useful discussions of the precautionary principle include T. Schettler, et al., 2000; European Environment Agency (EEA), 2001; European Commission, 2000.
5. The Alliance to End Childhood Lead Poisoning, 2000. This organization argues further that "the use of MMT is a classic case where scientific evidence proving its safety to human health and the environment should be required before its introduction… In essence, Ethyl is asking us to repeat the large-scale human experiment of TEL by exposing millions of people to a known neurotoxin and waiting to see what ill effects occur." Other critics include the Legal Resources Centre, 2000; J. Myers, 2000; J. Zayed, 1999.
6. EEA, 2001.
7. European Commission, 2000.
8. American Council on Science and Health (www.acsh.org), 1998.
9. See, for example, "The Montreal Protocol: lessons for international chemicals management," *Industry and Environment*, Vol. 27, No. 2-3 (April - September 2004), p. 23.

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Stakeholder engagement: an opportunity for SMEs?

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Summary
Stakeholder engagement and corporate social responsibility (CSR) concepts were mainly developed with large companies in mind. Due to growing awareness of the societal and economic importance of small and medium-sized enterprises, however, CSR has been increasingly promoted with respect to these companies. Low uptake of CSR by SMEs remains a challenge. Promoting SMEs' active engagement with external actors can initiate CSR activities and improve their CSR performance.

Résumé
Les concepts d'engagement des parties prenantes et de responsabilité sociale des entreprises (RSE) ont été élaborés en pensant surtout aux grandes entreprises. Mais avec la prise de conscience croissante de l'importance sociétale et économique des PME, de plus en plus d'efforts sont faits pour leur faire mieux connaître la RSE. Le faible taux d'adhésion des PME à ce principe reste cependant un problème. Les inciter à s'engager activement avec des acteurs externes leur permettrait de lancer des activités de RSE et d'améliorer leurs performances dans ce domaine.

Resumen
Los conceptos "participación de los actores" y "responsabilidad social corporativa" (RSC) nacieron, en gran medida, en el marco de las grandes empresas. No obstante, gracias a la creciente conciencia social e importancia económica de las pequeñas y medianas empresas (pymes), se fomenta cada vez más su RSC. Persiste el reto de lograr que las pymes adopten la RSC; promover su participación activa con actores externos puede estimular la organización de actividades de RSC y mejorar su desempeño en este sentido.

In the last decade the relationship between business and society has received more recognition than ever. Companies' environmental and social impacts have been discussed under the banner of corporate social responsibility (CSR), while a variety of concepts and instruments have been developed to address such issues. By applying these approaches, corporations can contribute to sustainability and demonstrate responsible behaviour in society.

A spectrum of societal actors external to a company (e.g. its suppliers, customers, the surrounding community and banks) represent the external "stakeholders". Active engagement with them has become a success factor for most businesses. Behaving responsibly towards stakeholders is also considered an aspect of the CSR concept.

Stakeholder engagement and CSR concepts were primarily developed and formulated from the perspective of large companies, mostly multinationals. With increasing awareness of the high societal and economic relevance of small and medium-sized enterprises (SMEs), CSR concepts have been increasingly promoted to this group. However, their low uptake in SMEs remains a challenge.

CSR management and communication in SMEs

SMEs provide employment and deliver products and services, and they are frequently regarded as sources of innovation. However, their responsibility to society might go further than this. Increasing demands have been made on SMEs to consider their environmental and social impacts and to act on them, thereby going beyond legally prescribed behaviour.

CSR management in SMEs

SMEs' CSR activities are noticeably different from those in large companies. A recent EU study (EU 2002) reported that over 50% of SMEs interviewed stated that they had undertaken some type of CSR activities. Nevertheless, the formal CSR management instruments prevalent in large companies are seldom applied by SMEs.

CSR activities can be categorized as *silent CSR* or as *ad hoc or strategic CSR management activities* (Table 1).

Most SME activities fall into the category of "silent CSR". Donations and sponsoring activities are prominent; priorities are selected according to intuition and personal links. Having been asked their motivation, only 15% of SMEs stated that they see a relationship to their financial success. Ethical motives were relevant for over 50%. This can be perceived as a characteristic result, as typical motivations seem to be to "do something good" or "give something back to society". 27% could not identify any advantage resulting from their CSR activities.

This last point in particular marks a difference with CSR management, which is concerned with "doing good" in a more systematic way while financially benefiting from the activities undertaken. CSR management uses tools and concepts that allow entrepreneurs to tackle situations in a routine way. Some, like the Deming Cycle, are adapted from "traditional" management theories.

CSR management can also be classified as strategic or ad hoc:

Strategic CSR management has become standard in large companies. The focus is strategic and long-term, a variety of complex and standardized tools and concepts are applied, and priorities are selected according to a systematic analysis of a company's impacts. Most of these concepts are inappropriate for smaller enterprises; they sometimes require the investment of substantial capital and time, which may not be feasible for SMEs.

Ad hoc CSR management is better suited to SMEs. It refers to practical, easily accessible CSR management concepts aimed at realizing short-term, sometimes immediate, improvements. Priority is given to "low-hanging fruit": CSR improvements that can be realized with limited resources and that provide clear, relatively guaranteed benefits. The most prominent example is "eco-efficiency". Creating "more value with less impact" enables enterprises to reduce their impacts on the environment while realizing savings in their resource expenditure, e.g. electricity and water bills. Some ad hoc CSR management is now practised in a variety of SMEs. Further uptake is inhibited by the existing supporting materials offered to SMEs, which are often not appropriately focused on their needs and abilities.

Communication in CSR management

While CSR management has an internal focus, CSR communication is concerned with communicating an enterprise's CSR attitudes, efforts and effects to actors outside the enterprise. Indicators are frequently applied in order to set targets, measure performance and communicate comparable results (**Figure 1**).

CSR *attitudes* refer to the CSR policies and targets set by an enterprise. They are frequently communicated as *codes of conduct* or *environmental policy* declarations.

CSR *efforts* cover activities and projects undertaken by an enterprise to improve its sustainability performance, e.g. changes in the production process to reduce the use of toxic chemicals. Management Performance Indicators (MPIs) are applied to report on these efforts undertaken in a company.

Effects, on the other hand, are the concrete outcomes of the company's operation, intended or unintended. These can be the unplanned release of toxic chemicals or a reduction of energy use through efficiency measures. Operational Performance Indicators (OPIs) are applied to provide information on how efforts were translated into actual effects on society.

With sound CSR communication, companies can improve their CSR management through learning processes as well as gathering some tangible benefits through an improved reputation.

Learning processes through communication can give management "an additional opportunity for improvement, through readers' reactions, criticisms and suggestions" (WBCSD). In the simplest case, SMEs can be informed about profitable improvement options, e.g. the potential to increase in-house efficiency. But they can realize further benefits. For example, by becoming better informed about trends and their implications for entrepreneurial chances and risks, they can create innovative products, enter or create new markets, and improve product quality. Although CSR communication is primarily concerned with providing information about the enterprise, it should include feedback channels.

With an *improved reputation* as the result of CSR communication, companies can realize benefits from better relationships to various external actors – cooperative relations with regulatory agencies, improved access to finance through a better risk situation, increased employee motivation, and constructive interaction with surrounding communities.

In practice, most SMEs do not actively communicate on CSR issues. This reflects the state of their CSR activities. "Silent CSR" is so called because ethically motivated activities do not lend themselves to marketing purposes. Entrepreneurs might even "feel bad" about profiting financially from ethically motivated activities. Having realized ad hoc CSR management, entrepreneurs might not feel the urge to report, as they have only realized some inherently profitable measures.

Strategic CSR management often includes corporate CSR reports and corporate CSR websites. While these are becoming increasingly mainstream in the corporate communication of big multinational companies, they are scarcely used by SMEs (as, for example, reflected in the GRI database). Neither are other, less demanding options for CSR communication (e.g. mailing lists, notice boards) often used by SMEs. Besides the lack of activities and material progress on which to report, this can be attributed once again to the inadequacy of the support materials available to SMEs (two sites which give good support are www.efficient-entrepreneur.net and www.smart-business.bz).

Stakeholder engagement and SMEs

Linking CSR with stakeholder engagement

As indicated above, SMEs are not yet "on board" in terms of CSR management and communication. Engaging with stakeholders can positively contribute to CSR management in different phases of the management cycle (**Figure 2**), from the target-setting phase to the final evaluation as described below.

Learning about stakeholders' priorities

SMEs cannot do everything at once due to resource constraints. Stakeholder engagement can provide valuable inputs for setting priorities. Implementing changes that matter can motivate them to undertake further CSR efforts.

Obtaining external knowledge

SMEs depend on external knowledge even more than do large companies. They are often unaware of legislation, and even less aware of CSR management concepts and the associated benefits. A range of external actors has begun to provide CSR knowledge to SMEs. CSR researchers now agree that it is effective to offer CSR knowledge through actors already aligned with the SMEs. Thus, these enterprises can benefit from stakeholder engagement in accessing previously unconsidered sources of knowledge.

Obtaining support – finding partners and networks

Acquiring external knowledge is an aspect of SME networks, but these networks go further than that. External actors are normally unaware of individual SMEs' CSR performance. The activities of a single SME often do not matter to societal actors. In regional or sector networks, however, they may attract the attention of NGOs, the media, regulatory agencies and, finally, consumers.

Furthermore, most indicators that could be reported by SMEs are comparative. Time-spanning comparisons (e.g. on a yearly basis) are problematic for them, as SMEs often have a short-term focus and need quick results. Stakeholders can be empowered to compare different companies' performance through regional SME reports or through reporting according to a sector-wide standard.

Why do SMEs go for CSR? Some lessons learned from the UN Global Compact

The UN Global Compact (GC) is a voluntary agreement that addresses business's concerns about human rights, labour standards, environmental issues and corruption. By signing it, companies commit themselves publicly to its ten principles. Although the Compact is aimed at large multinational companies, 12% of the signatories are SMEs, as reported by the UN Industrial Development Organization (UNIDO), which surveyed the participating SMEs. Analysing the motivations of these SMEs illustrates the importance of stakeholders in driving their decision to join.

First, SMEs that became part of the Global Compact got to know about it mainly through external actors, particularly business partners and chambers of commerce which have participated in the GC's national launch activities. Support from these institutions has proven critical in motivating SMEs.

The main *international assistance* expected from SMEs shows that they see a strategic dimension to what they do: entering global markets and acquiring skills and best business practice through partners are by far the most important points made. However, looking at motivations reported by SMEs, a mixed picture appears. Humanitarian concerns are the most prevalent – a pure internal motivation that does not depend on interaction with external actors. The desire to establish a link with the UN, to network with other SMEs, or to have an improved relationship with customers were also prominent, showing that for at least some of these enterprises strategic issues associated with their stakeholders played a role.

Table 1
Different CSR options and their uptake in SMEs

	CSR management		
	"silent CSR"	ad hoc	strategic
motivation	ethical: "give something back to society"; "help other people"	pragmatic: do some things that matter to society and pay off for the enterprise	strategic: reap long-term business benefits and create value through socially responsible behaviour
typical activities	donations, sponsorship, employee benefits	eco-efficiency, sustainable procurement	management systems, Impact Assessment, life-cycle focus
selection of priorities	intuition, personal links	fast and secure benefits, "low-hanging fruit"	systematic analysis of companies' impacts
SMEs' situation	widespread, typical CSR attitude of owner-managers in SMEs	appropriate, but sometimes not applied due to insufficient support material	often inappropriate: too costly and time-intensive, long-term focus

Obtaining external feedback

Lack of knowledge in SMEs about their own impacts, as well as the need for a step-wise approach, make feedback important. Feedback can enforce the activities undertaken, showing that these efforts actually matter to actors outside the enterprise and making additional activities more likely. Furthermore, they can help SMEs to revise the priorities taken. Actions that do not generate any external response were probably not focused on the issues that matter, and in the future should be substituted by more valuable action that will be recognized beyond the enterprise.

SMEs' stakeholder environment

By promoting CSR with a stakeholder focus, external actors can become the key to initiating CSR management and communication activities. To make this work, a look at SMEs' concrete patterns in stakeholder relations is valuable: who are they aligned to, and do these actors care about the SMEs' CSR performance?

Actors that pushed and continue to push large companies towards CSR do not approach SMEs with the same intensity. This is certainly true in the case of NGOs and the media, which create and live by public attention cycles. Following these cycles, customers also pay more attention to large companies' performance. It is also true for regulatory agencies and politicians, especially in developing countries.

Still, most SMEs do not operate in isolation from other actors. They are integrated into networks that are crucial to their operations. More than large companies, they depend on "goodwill" in their external relations. "Trust" and "credibility" are more important in taking up and maintaining business relationships, including employee recruitment. In fact, most SMEs actually *do* engage with their stakeholders. Owner-managers in particular have relationships with a range of local actors, communicating and aligning with them. This can occur on an informal and daily level.

Although it may not be recognized by SMEs in their daily work, their business success is based on this *silent stakeholder engagement*. SMEs that are unable to inspire trust and confidence in their partners will most likely not remain in business, while a manager who does not know his employees well will not fully utilize the potential of his company's "human resources".

Compared with large companies, SMEs cannot easily shift their operations. They cannot "run away" from conflictual relationships with neighbours or communities, but are obliged to deal with existing confrontations.

Large companies driven by pressures in their main markets have begun to implement sustainability issues in their supply chains. Besides environmental concerns, the reasons have included social issues like human rights, labour rights and health and safety issues. As part of the supply chains, SMEs are affected by these requirements, which are sometimes implemented more strictly than the laws in their own countries. The requirements can be quite challenging for SMEs: ideas and concepts, sometimes coming from a different cultural and social background, have to be implemented and the progress reported.

Figure 1
Communication along the management cycle

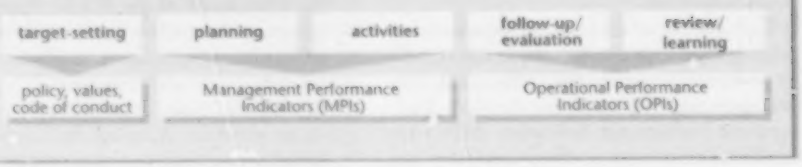
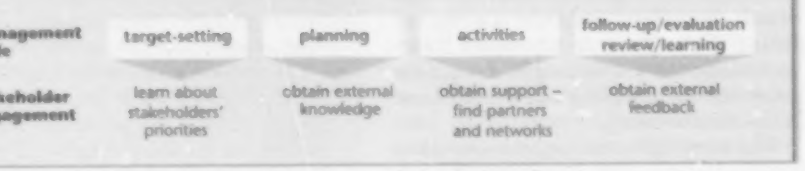


Figure 2
How communication can increase the efficiency of management processes



CSR campaigns addressing SMEs

The existing stakeholder links described above can be used by advocates of CSR in two ways:

1. Incorporating concrete and achievable stakeholder engagement aspects into a CSR instrument can make application in SMEs more beneficial, as described above, facilitating their uptake;
2. Taking advantage of SMEs' stakeholder environment can help distribute tools and motivate SMEs to apply them.

A variety of campaigns try to promote CSR to SMEs. Most implicitly or explicitly consider stakeholder engagement. The EU's CSR campaign and the GRI approach to SMEs actively promote stakeholder engagement, with the latter giving more explicit support concerning how to engage with stakeholders.

Identifying stakeholders – the *High5!* approach

In guiding SMEs to identify stakeholders, *High5!* proposes three steps:

- *Review your core business activities and goals.* This helps the enterprise to identify its internal goals: those related to core business activities, as well those related to its sustainable development goals.
- *Map your stakeholders and their interests.* SMEs can identify which actors are important to their business internally and externally. A matrix linking each stakeholder to "key business priorities" (such as "enhanced reputation" and "increased staff motivation") can help SMEs get a grasp of the strategic dimension of their stakeholder relations and how they could benefit from more pro-active alignment with them.
- *Identify the aspects to report on.* As stakeholders have different concerns and information interests, selection is based on the identified stakeholders. What are the issues that mainly concern key stakeholders? The answer can help orient the communication towards the specific needs of the target audience.

The EU CSR campaign

The EU campaign to raise CSR awareness in SMEs puts the relationship with the companies' stakeholders at the centre. Responsible entrepreneurship is defined as being "essentially about maintaining economic success and achieving commercial advantage by building reputation and gaining the trust of people that work with or live around your company." It therefore introduces a valuable and, in the majority of cases, new viewpoint to SMEs on their responsibility. *A Guide to Communicating about CSR* (europa.eu.int/comm/enterprise/csr/campaign/documentation/download/guide_en.pdf) was published as part of the EU CSR awareness raising campaign.

Besides addressing stakeholders in its support materials, the EU CSR campaign uses chambers of commerce to disseminate its ideas. CSR is likely to be taken more seriously when it is promoted by a business organization that has positive experiences with it.

The Global Reporting Initiative (GRI)

Since the Global Reporting Initiative (www.globalreporting.org) published the second version of the Sustainability Reporting Guidelines, these guidelines have become the standard for CSR reporting by large companies. GRI's first publication aimed at SMEs, a handbook called *High5!*, was launched in November (www.globalreporting.org/workgroup/sme/intro.asp). *High5!* presents a reporting guideline for SMEs. It identifies relevant aspects on which to report, from a stakeholder point of view, as well as information for following up and collecting feedback. It helps SMEs to plan and undertake their communication efforts systematically and to assess the quality of their reporting.

Applying the whole range of GRI indicators might not be feasible in many SMEs. Therefore, a

process is needed for selecting indicators to report on. Learning about stakeholder priorities is a key feature of *High5!* Assessing priorities and reporting exclusively on them is proposed, at least for the "first round" of reporting. As practical experience grows, widening of the scope is encouraged. This approach to setting priorities takes internal business activities and goals into consideration and links them to stakeholders and their interests. Indicators to report on should be relevant to significant actors and have an impact on tangible and intangible business values.

When evaluating the report, incorporation of external feedback and the pursuit of external recognition (e.g. awards) is part of the tool offered. Thus, companies have the chance to initiate a learning cycle reflecting their priorities and the derived indicators reported on. This revision process enables SMEs to continually improve their CSR activities and reporting, better responding to stakeholders' needs and concerns.

Pilot implementation projects will be undertaken in different countries worldwide in 2005.

Conclusions

CSR management and communication offer benefits to SMEs – but their engagement until now has been markedly one of "silent CSR", without a strategic focus. As CSR remains an ethical issue for most SMEs, they do not see the business relevance of what they do. Thus, they may miss out on important business opportunities and on opportunities to really make a difference by responding to stakeholders' needs and concerns.

A stakeholder focus can provide a starting point to overcome these drawbacks. It can introduce SMEs to the CSR strategic viewpoint, thereby promoting their greater engagement in environmental and social issues by increasing the benefits to these enterprises of activities undertaken in this direction.

Advocating stakeholder engagement must take into account the situation of SMEs. They are connected differently to actors in their surroundings than are large enterprises. Tools guiding SMEs that decide to engage with stakeholders should pay attention to this fact. For example, a specific review of actors already "silently" engaged with should be the basis of further analysis. GRI's *High5!* takes some steps in the right direction. Although it is a handbook on *reporting*, it enables SMEs to take a first look at the stakeholders surrounding them and analyse their priorities. More guides effectively linking SMEs to their societal surroundings could potentially increase the number of them engaged in CSR activities.

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World News

Projects in Europe and the US look at how to use biomass in ethanol production

A new technology, developed with EU funding, can turn corn stubble and other agricultural or forestry waste into basic ingredients for making ethanol. The project team responsible is based in Scandinavia, Hungary and Italy. It uses techniques such as gene splicing to break down chemicals during fermentation.

Over 75 million tonnes of stubble is left on the ground every year following Europe's harvests. Fermenting it would create a quarter of a million litres of ethanol, equal to total current world production. European crops are much more difficult than sugar cane to turn into ethanol. However, project scientist Lissa Viikari of Finland's VTT Technical Research Centre says that "We can longer afford to waste our biomass."

In Palo Alto, California, scientists from the US Department of Energy's National Renewable Energy Laboratory have announced the completion of a four-year collaboration with the private sector that will make possible a commercially viable process that uses agricultural waste in ethanol production by reducing the costs of enzymes. The new technology is considered an important step towards commercially viable "biorefineries" in which plant and waste materials would be used to produce fuels and chemicals.

For more information, see www.wbcsd.ch (case studies). ◆

Getting rid of UK's fridge mountains

The UK government has allocated tens of millions of pounds to local councils to help them recycle foam and refrigerant gases in old refrigerators. Three years after EC Regulation 2037/2000 on Substances that Deplete the Ozone Layer came into effect, Britain is struggling to keep its "fridge mountains" from becoming "mountain ranges".

Under the EC Regulation, insulating foam inside refrigerators and freezers must be carefully disposed of to keep ODS from escaping. Delays in implementing the regulation have created an enormous backlog, with "fridge foothills" becoming "fridge mountains." Fires have broken out in some fridge mountains in the Greater Manchester area and elsewhere.

Until the practice was banned, the UK exported large numbers of old refrigerators to developing countries (for medical and other purposes). Some critics suggest that this is one reason for delays in putting the needed technology in place.

For more information, see europa.eu.int/eur-lex. ◆

Philippines bans logging after fatal floods, Brazil considers "sustainable forestry"

In early December, President Gloria Arroyo of the Philippine placed a total ban on logging in that country – legal and illegal – after widespread deforestation was blamed for much of the damage caused by four major storms. Over 1300 people were reported dead or missing, and many thousands lost their homes, after these storms.

While some environmental experts welcomed President Arroyo's action, they pointed out that such a ban would not in itself prevent similar disasters. They called for large-scale reforestation and a stronger fight against the corruption. Of 21 million hectares of forest existing a century ago, it is estimated that less than 6% is now intact.

A few weeks earlier, on 9-12 November, a conference of scientists and other experts was organized in the Philippines by the environmental organization Haribon, Birdlife International and the European Community. Participants were told that the Philippines does not lack adequate laws to protect what remains of its extraordinary natural heritage. Nevertheless, forest depletion has been taking place at something like 200,000 hectares per year, one of the highest rates in the world. At the Conference the Philippines' Environment Secretary, Michael Defensor, estimated that government reforestation in the past two decades has had only a 30% success rate.

Brazil is another country that has experienced enormous and irreplaceable forest losses. On 10 December, during COP 10, it released a long-delayed report showing that it had been one of the world's biggest producers of greenhouse gas emissions between 1990 and 1994 as a result of burning of the Amazon and other rain forests. Deforestation was responsible for 70% of all pollutant emissions in these years.

A controversial law allowing long-term concessions for sustainable forestry to be granted has been introduced in the Brazilian Congress. If approved, it would give concession-holders access to public land for sustainable use. Those in favour of the law see it as a way to ensure that the use of public lands remains under public control. Opponents have described it as a "plan to privatize the Amazon", including land belonging to indigenous people. Representatives of NGOs and social groups are taking part in debating the complex new law. A similar plan adopted in Peru two years ago is currently being revised, based on experience with its application.

Concerns about another cause of forest devastation were also raised in December when Brazil and Peru announced their intention to build a 711-mile "Transoceanic Highway" linking the Brazilian Amazon Basin and the Pacific.

For more information, see www.wbcsd.ch. ◆

Declaration on Nitrogen Management presented to UNEP

Meeting in Nanjing, China, on 12-16 October, the Third International Nitrogen Conference adopted the Nanjing Declaration on Nitrogen Management. The declaration urges policymakers to maximize the benefits of nitrogen use while minimizing the adverse effects of N losses to the environment. Signalling the need for action at the very highest levels, the declaration was presented to Wenjuan Zhang, a representative of UNEP in the People's Republic of China. It will be sent to Klaus Toepfer, UNEP's Executive Director, for consideration, and to relevant agencies of national governments.

The Declaration calls upon UNEP "to promote understanding of the nitrogen cycle, assess consequences of its disturbance, provide policy advice

Logging in Mindanao, Philippines

and early warning information, and catalyze and promote international cooperation" – in conjuction with other relevant bodies.

It also calls upon national governments to optimize nitrogen management locally, regionally and globally by, among other means, "a code of good agricultural, forestry, and aquacutural practices."

The topics addressed in Nanjing concerned the importance of nitrogen in food production and the adverse effects of nitrogen losses to the environment from agricultural, industrial or urban sources. Approximately 400 participants from around the world came from such diverse disciplines as agronomy, ecology, biogeochemistry, oceanography and atmospheric science, as well as other sciences dealing with agriculture, animal husbandry, forestry, fishery and energy production.

Reactive nitrogen is the main constituent of modern fertilizer. The green revolution in world agriculture would not have been possible without it. However, it is also causes eutrophication, ozone layer damage and other environmental problems.

"So far, nitrogen has been regarded as a regional problem in some agricultural and industrial areas of the world," says James Galloway, chairman of the International Nitrogen Initiative and environmental sciences professor at the University of Virginia. "The consensus of the experts we assembled for the conference was that many other areas show environmental impacts as the result of large leakages of nitrogen into the environment, even as there remain regions with too little nitrogen for sufficient food production. The declaration urges development of a comprehensive approach to optimizing nitrogen management in food and energy production while minimizing the environmental impacts."

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Founder of Kenyan Green Belt Movement receives Nobel Peace Prize

The 2004 Nobel Peace Prize has been awarded to Wangari Maathai of Kenya "for her contribution to sustainable development, democracy and peace."

In a statement explaining its choice, the Nobel Committee said: "Peace on earth depends on our ability to secure our living environment. Maathai stands at the front of the fight to promote ecologically viable social, economic and cultural development in Kenya and in Africa. She has taken a holistic approach to sustainable development that embraces democracy, human rights and women's rights in particular. She thinks globally and acts locally."

Wangari Maathai of Kenya accepts the Nobel Peace Prize

The Committee's chairman reported that the Director of the Nobel Institute "called her on a poor mobile phone connection to tell her that she had been awarded the Nobel Peace Prize… Maathai was visiting the little village of Ihururu, 95 kilometres north of Nairobi, distributing food from the government. Her Kenyan listeners – mostly women – clapped politely when she told them that she had been awarded the Peace Prize. But they laughed out loud when she told them that she had been given so much money that she couldn't even count it."

In his address the chairman summarized the Nobel laureate's career:

"Most unusually for African girls from the provinces, she received higher education in Kenya. On completing her Kenyan education, she went to the United States, where she took a Bachelor's and a Master's degree. In 1971 she became the first woman in Kenya to take a doctorate, subsequently becoming the first female professor at the University of Nairobi.

"As a biologist, she saw the problems that deforestation and soil erosion were causing in rural areas, especially for the women who do most of the physical work. Grazing areas for livestock were being destroyed. The women were having to go further and further in search of wood for cooking. In 1977 Maathai took an important decision. She resigned from her chair, and on the 5th of June, World Environment Day, she planted nine trees in her backyard and founded the Green Belt Movement. Its aim was to restore Africa's forests and put an end to the poverty that deforestation was causing.

"In the 1980s, Maathai became the Chairperson of the National Council of Women, and her successes with tree-planting and political campaigning for women brought her into conflict with the authorities. …The struggles for the environment, for democracy and for women's rights all came together to form a whole. In due course many men also joined her movement. Maathai's many initiatives exposed her to harassment. She was repeatedly sent to prison; she was attacked with tear gas and clubbed… In 2003, in the broad coalition government that took over, Maathai was appointed Deputy Minister of Environment, Natural Resources and Wildlife.

"You are the first woman from Africa to be honoured with the Nobel Peace Prize. You will also be the first African from the vast region between South Africa and Egypt to receive the prize. You stand as an example and a source of inspiration to everyone in Africa who is fighting for sustainable development, democracy and peace."

"Trees for Democracy": from Wangari Maathai's response

"When I was growing up in Nyeri in central Kenya, there was no word for desert in my mother tongue, Kikuyu. Our land was fertile and forested. But today in Nyeri, as in much of Africa and the developing world, water sources have dried up, the soil is parched and unsuitable for growing food, and conflicts over land are common. So it should come as no surprise that I was inspired to plant trees to help meet the basic needs of rural women…I listened as women related what they wanted but did not have enough of: energy, clean drinking water and nutritious food.

"My response was to begin planting trees with them, to help heal the land and break the cycle of poverty. Trees stop soil erosion, leading to water conservation and increased rainfall. Trees provide fuel, material for building and fencing, fruits, fodder, shade and beauty. As household managers in rural and urban areas of the developing world, women are the first to encounter the effects of ecological stress. It forces them to walk farther to get wood for cooking and heating, to search for clean water and to find new sources of food as old ones disappear.

"My idea evolved into the Green Belt Movement, made up of thousands of groups, primarily of women, who have planted 30 million trees across Kenya. The women are paid a small amount for each seedling they grow, giving them an income as well as improving the environment. The movement has spread to countries in East and Central Africa.

"Through this work, I came to see that environmental degradation by poor communities was both a source of their problems and a symptom. Growing crops on steep mountain slopes leads to loss of topsoil and land deterioration. Similarly, deforestation causes rivers to dry up and rainfall patterns to shift, which, in turn, result in much lower crop yields and less land for grazing…

"Land issues in Kenya are complex and easily exploited by politicians. Communities need to understand and be sensitized about the history of land ownership and distribution in Kenya and Africa."

See: http://nobelprize.org/peace/laureates/2004; www.greenbeltmovement.org/biographies.htm.

Industry Updates

Extreme weather losses: record high for insurance industry

As a result of hurricanes, typhoons and other weather related natural disasters, 2004 is set to be the most expensive year yet for the world insurance industry. Figures released at COP-10, the Climate Change Convention in Buenos Aires on 6-17 December, showed that during the first ten months of this year natural disasters cost the industry just over US$ 35 billion, up from16 billion in 2003. This was before the undersea earthquake and tsunami in the Indian Ocean the week after Christmas.

The United States, at over $26 billion, suffered the highest insured losses, according to preliminary figures. Global insured losses are likely to be even higher when the months of November and December are brought into the equation.

Economic losses, the majority of which were not insured, will also have cost the planet and its people dear. According to preliminary January to October figures, these losses were also among the highest on record, totaling about $90 billion so far, up from over $65 billion in 2003.

Many small, developing countries have been the hardest hit, with the islands of Grenada and Grand Cayman in the Caribbean demonstrating the impact on fragile economies. Hurricane Ivan, which struck Grenada in September, killed 28 people and is estimated to have cost US$ 1 billion in damaged homes, buildings and agricultural losses. It may take several years for the key crops of nutmeg and cocoa to recover, leaving thousands of workers facing unemployment until production is restored.

The insurance industry is concerned that new, climate-related risks may be emerging. Hurricane Catarina, which hit Brazil earlier this year, developed in the Southern Atlantic, where sea surface temperatures are normally too low to trigger tropical cyclones.

Klaus Toepfer, Executive Director of UNEP, told the Climate Change Convention:

"Climate change is already happening with rapid melting of the Arctic and glaciers worldwide. Climate scientists anticipate an increase [in the number] and intensity of extreme weather events, and this is what the insurance industry is experiencing, resulting in year on year losses.

"In many developing countries the impacts of high winds and torrential rains are aggravated by a variety of factors, ranging from the clearing for forests making hilly slopes more vulnerable to land slips and slides to a lack of enforcement of building codes. Reducing vulnerability and helping poorer nations cope with the ravages of climate change is vital. Some experts estimate that for every one dollar invested in disaster preparedness, you will save six dollars in reconstruction costs.

"However, it cannot be an alibi for inaction on emission cutbacks. In the end, many smaller countries like low-lying small island developing states, and countries like Bangladesh, can only adapt for so long before they are eventually overcome by the impacts of storm surges and rising sea levels."

The findings on the preliminary costs of weather-related natural disasters have come from Munich Re, one of the world's largest reinsurance companies and a member of the UNEP Finance Initiative.

Thomas Loster, a senior executive and climate expert with Munich Re, elaborated:

"As in 2002 and 2003, the overall balance of natural catastrophes is again clearly dominated by weather-related disasters, many of them exceptional and extreme. Indeed 98% of all losses for 2004 and about 100% of insured losses were weather driven. We need to stop this dangerous experiment human-kind is conducting on the Earth's atmosphere.

"According to our latest findings, economic losses from January to October are in the order of $90 billion. The average value of the last ten years has been $70 billion. Insured losses, driven by weather or climate-related disasters, will amount to more than $30 billion, making 2004 the costliest natural catastrophe year ever for the insurance industry worldwide. There are indications that the figures will further increase.

"I would urge delegates and governments here in Buenos Aires to make a strong commitment to a post Kyoto agenda. Otherwise the industry's appetite to finance and insure projects under the instruments of the Kyoto Protocol, such as the Clean Development Mechanism, will be blunted."

For more information, contact: Eric Falt, UNEP Spokesman/Director, Division of Communications and Public Information, Tel: +254 20-623292, Mobile: +254 733 682656, E-mail: eric.falt@unep.org. Details of the Caribbean Community Climate Change Centre can be found at www.caribbeanclimate.org. The full report by Munich Re, to be published in early 2005, will be available on www.munichre.com. ◆

Some disasters in 2004

- **Hurricane Catarina hit southern Brazil in March**, causing an estimated US$ 350 million in economic losses. This was the first time since worldwide observations began that a hurricane developed in the Southern Atlantic.
- **Hurricane Jeanne released torrential rain on Hispaniola**, causing severe flooding and killing more than 2000 people in Haiti and the Dominican Republic.
- **A record number of ten typhoons made landfall in Japan**, the most destructive of which were Chaba, Songda and Tokage, one of the strongest typhoons ever. Altogether they caused economic losses of $10 billion and insured losses of more than $6 billion.
- **Hurricane Ivan** was one of the most destructive and strongest storms ever, maintaining a strength of category force 4 to 5 on the Saffir Simpson for more than five days. Apart from the Caribbean islands, the storm caused serious damage to offshore platforms in the Gulf of Mexico. Economic losses are estimated as up to $3 billion.

Dr Kenrick Leslie, Director of the Caribbean Community Climate Change Centre (which is hosted by the Government of Belize and supported by UNEP), says Ivan was as a "unique event never before seen in the Caribbean. Grenada normally escapes such events, but here was a hurricane that formed south and east of the Antilles. "It is believed to be the first yime in recorded history that a hurricane has formed so far south and east of the Antilles."

Dr Leslie, who established the national meteorological service in Belize, and whose organization covers 15 countries in the wider Caribbean, adds that the impact on the economy of Grenada was "both worrying and distressing."

The estimated damage of one billion dollars was twice the islands' gross domestic product. Close to 30,000 houses (or nearly 90%) were damaged, of which 10,000 or nearly one-third were beyond repair.

Damage to schools and centres of learning amounted to $90 million, with over 30,000 students affected. The damage to hospitals and public health care centres is estimated at over $4 million. Over 38,000 people have been left unemployed in the key agricultural sectors of nutmeg and cocoa.

South African sugar industry introduces sustainable livelihoods approach

The South African sugar industry is experimenting with the sustainable livelihoods approach (SLA) to do business with small-scale sugar cane farmers. While some 2000 large-scale commercial operations in South Africa are responsible for

80% of total production, another 48,000 small-scale growers farm communal land. Over half these growers, who generate R450-600 million (US$ 65-105 million) in income for rural and impoverished areas, are women.

The sustainable livelihoods initiative is being piloted in the sugar-growing Komati, Sezela and Maidstone regions. Activities carried out to introduce SLA include "leadership and buy-in" (i.e. understanding that small-scale sugarcane farmers need support as stakeholders, beyond their direct function as sugar cane suppliers) and the development of literature on practices in other parts of the world.

Activities are at an early stage, but the positive results reported include: enhanced awareness of conditions in operational areas (e.g. the extent of unemployment); understanding by sugar industry leadership of the need to promote local solutions championed by local leadership; emerging opportunities for income diversification in communities (e.g. agri-business development and alternative income streams to increase financial independence); and greater awareness by all stakeholders, including business, local government and the community, with a focus on gender and all age groups.

For more information, see: www.sugarindustry-dev.co.za and www.wbcsc.ch (case studies). ◆

Green often means money for socially responsible companies

A study published in *Investor's Business Daily* on 6 December demonstrates that socially responsible companies can cut costs and attract investors.

Intel, McDonald's, Dell, Microsoft, DuPont, Ford, Procter & Gamble and hundreds of other US companies have presented themselves as socially responsible in recent years. Intel's goal in 2004 was to recycle half of its chemical waste, cut energy use by 4% and use recycled paper in 30% of copiers. Intr' also promised it would promote more women and minorities and encourage 30% of its employees to participate in volunteer programmes.

Although there are no federal or legal requirements for companies to report on such activities, mutual fund managers say the reports provide a sharper view of a company's performance.

Intel has filed such reports since 2001. The most recent report included information on water and energy use, GHG emissions, and health, safety and diversity. "It can seem to be an impossible task to put all of this together, because the time it takes is quite extensive," Intel's director of social responsibility told *Investor's Business Daily*. "But it's clear to us there are benefits to doing this."

Intel recycled 40,000 tonnes of material in 2003. By working closely with the US Environmental Agency's Energy Star programme, it expects to save enough energy this year to power the equivalent of 11,000 homes.

Being socially responsible can benefit companies in the market. Meir Statman, professor and chair of the Finance Department at Santa Clara University's Leavey School of Business, told the newspaper: "There are people who care very deeply about social issues and therefore you have more people willing to buy your stock."

Companies focusing on social issues clearly want to improve their reputation. They spend large amounts on advertising to convince people that they are indeed environmentally friendly and socially conscious. A portfolio manager with an important firm told the newspaper that socially responsible investing has plenty of room to grow. "We believe this market has been underserved," he said. "This form of corporate governance reporting can be used to help flag management competence. If managers can do it, it's an indicator they are well-organized."

According to a research analyst with Trillium Asset Management, an independent investment adviser that deals exclusively with socially responsible investing, corporate reports that focus on social issues are "a corporate governance exercise, not a public relations exercise." He added that "We see this whole process as good governance. Companies are thinking through key social and environmental impacts and risks and implement systems to minimize those risks."

Statistically, there is no significant relationship between the degree of social responsibility and the return on company investments," says one expert. However, companies see advantages.

"From an investor viewpoint, it's a small and growing area," says the director of sustainable development at DuPont. "But we're not doing it just for that reason. It's better for our business and shows that we're operating more efficiently." DuPont has reported that its energy consumption is 9% below its 1990 base, with cumulative savings of almost $2 billion – despite a 30% increase in production.

As more companies report on their green activities, "the manner in which they provide such information now varies widely," says the Global Reporting Initiative (GRI), an organization that promotes social and environmental considerations. To make reporting more uniform, GRI compiles Sustainability Reporting Guidelines. If companies want to qualify and gain GRI's endorsement, they have to complete a 70-question form and agree to meet the report guidelines.

Socially responsible is not a new idea. In the mid 18th century Quakers would not invest in weapons or slaves. More recently, a number of companies refused to invest in South Africa during apartheid. Nevertheless, the benefits of socially responsible business and investing are not always clear. Some socially responsible companies perform extremely well while others underperform. Moreover, the term "socially responsible" is not strictly defined.

One investor told the newspaper that the trend towards social responsibility won't go away. "It will become the norm," he said. "In five or ten years, most companies will do sustainability reporting."

For more information, see: www.investors.com; www.wbcsd.ch (case studies); www.globalreporting.org. ◆

UNEP Focus

Environmental issues emerge from Asian disaster

As soon as the Asian earthquake and tsunami occurred, UNEP created a Task Force in Geneva to coordinate all inputs from the UNEP system to identify and alleviate the disaster's environmental impacts and support the efforts of affected countries and the UN.

US$ 1 million was mobilized to respond to immediate needs identified by the region's governments. Klaus Toepfer, UNEP's Executive Director, explained that this support "echoes directly the requests from national authorities for environmental experts to assess and mitigate the urgent problems. Therefore we are sending experts to work with the governments and the UN country teams." UNEP's office in Bangkok, which is responsible for activities in the Asia-Pacific region, was also strengthened.

"While the focus is to save lives and fight diseases," said Mr. Toepfer, "it is also important to address underlying risks, such as solid and liquid waste, industrial chemicals, sewage treatment and the salinization of drinking water. The damage to ports and industrial infrastructure may be severe, with untold risks to human health. Likewise, revitalizing local communities and their livelihoods will require rehabilitating and protecting vital natural ecosystems, in particular mangrove forests and coral reefs."

He added that "UNEP is mobilizing its remote sensing and Geographic Information System (GIS) capacities, in collaboration with other UN agencies, to help identify impacts and make relevant information available to relief efforts. All in all, a number of grave environmental concerns must be taken into account as the reconstruction plans are drawn up."

Several governments in the region have stressed to UNEP the importance of developing effective early-warning systems. This issue will be high on the agenda of an international meeting concerning the Sustainable Development of Small Island Developing States (SIDS), scheduled to take place in Mauritius on 10-14 January 2005 (www.un.org/smallislands2005/ and www.sidsmauritius2005.mu/) and at the World Conference on Disaster Reduction (WCDR), scheduled to take place in Kobe, Japan, on18-22 January (www.unisdr.org/wcdr). UNEP will be one of the main contributors to each conference.

Earlier in December, UNEP had already warned that 2004 would go down in history as the most expensive year for the insurance industry worldwide as a result of hurricanes, typhoons and other weather-related natural disasters (see "Industry Updates").

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UN disaster relief activities are coordinated by the Office for the Coordination of Humanitarian Affairs (OCHA) (http://ochaonline.un.org/index.asp and www.reliefweb.int/w/rwb.nsf). ◆

COP 10 in Buenos Aires "brings adaptation into the mainstream"

The Climate Change Convention in Buenos Aires, Argentina, on 6-17 December marked the tenth anniversary of the entry into force of the UN Framework Convention on Climate Change. COP 10 concluded with the adoption of a package of measures aimed at helping countries prepare for climate change.

"This was a conference of hope, sparked by the momentum generated by the upcoming entry into force of the Kyoto Protocol on 16 February 2005," said Joke Waller-Hunter, the Convention's Executive Secretary. "The meeting succeeded in bringing adaptation into the mainstream of the intergovernmental process."

In view of growing evidence that the impacts of climate change are already being detected, countries adopted the Buenos Aires Programme of Work on Adaptation. This programme includes new workshops and technical papers on various aspects of climate change risk and adaptation, together with support for the mainstreaming of adaptation into sustainable development planning. Further scientific assessments of vulnerabilities and options for adaptation will be carried out, and support will be given to the least developed countries' National Action Plans on Adaptation.

The conference asked the UNFCCC secretariat to convene a seminar of government experts in Bonn in May 2005. Their task will be to "promote an informal exchange on actions relating to mitigation and adaptation to assist Parties to continue to develop effective and appropriate responses to climate change; and policies and measures adopted by their respective governments that support implementation of their existing commitments under the UNFCCC and the Kyoto Protocol."

The Bonn seminar is to be conducted "without prejudices to any future negotiations, commitments, process, framework or mandate under the Convention and the Kyoto Protocol."

The conference welcomed the concrete progress made with respect to the Kyoto Protocol's Clean Development Mechanism (CDM). The way was opened for new types of CDM projects related to small-scale forestry, adding to existing possibilities such as projects that reduce methane from landfills or promote renewable energy. In a move supported by business observers, the conference agreed to a strengthening of the CDM's Executive Board.

Other key decisions concerned the rapidly evolving carbon market. The European Union's Emissions Trading Scheme was presented by the EU Environment Minister, Stavros Dimas. The EU scheme allows the use of the Kyoto "flexible mechanisms." Thus projects undertaken outside the EU may count towards meeting EU emission reduction targets. Emissions trading will become a reality in the EU on 1 January 2005.

Indonesia, Liechtenstein and Nigeria joined the Kyoto Protocol during or just before the conference, bringing the total number of Parties to 132. Several other countries announced that their ratification of the Protocol was under way.

Conference highlights included the first national communications by Brazil and China outlining their strategies for addressing climate change.

Besides adopting formal decisions, the annual Conference of the Parties has evolved into a global forum for businesses, environmental groups and others to exchange ideas, make contacts and present new reports and findings. This year there were 60 exhibits and over 150 seminars and other events.

During the final high-level segment on 15-16 December, some 85 ministers along with heads of delegation participated in a lively exchange during four panel discussions. The themes were "The Convention after ten years: accomplishments and future challenges," "Impacts of climate change, adaptation measures and sustainable development," "Technology and climate change" and "Mitigation of climate change: policies and their impacts."

COP 10 was attended by some 6200 government officials, UN and NGO observers and journalists. The next annual conference, consisting of COP 11 (for the Convention) and COP/MOP 1 (for the Protocol), will take place on 7-18 November 2005.

For further information, contact the UNFCCC Media Office, Tel: +49 228 815 1000, E-mail: press@unfccc.int. Also see www.unfccc.int. ◆

Kyoto Protocol will enter into force

The 90-day countdown to the Kyoto Protocol's entry into force was triggered by the receipt of the Russian Federation's instrument of ratification by the United Nations Secretary-General, Kofi Annan, on 18 November. The Protocol will

become legally binding on its 128 Parties on 16 February 2005.

"A period of uncertainty has closed. Climate change is ready to take its place again at the top of the global agenda," said Joke Waller-Hunter, Executive Secretary of the Climate Change Secretariat, which services the UN Climate Change Convention and its Kyoto Protocol.

"Next month's ministerial conference in Buenos Aires will provide the next major opportunity for governments, businesses and civil society to promote the innovative new policies and technologies that will create the climate-friendly economy of the future," she added.

The Protocol's entry into force means that from 16 February 2005:

1. Thirty industrialized countries will be legally bound to meet quantitative targets for reducing or limiting their greenhouse gas emissions.
2. The international carbon trading market will become a legal and practical reality. The Protocol's "emissions trading" regime enables industrialized countries to buy and sell emissions credits among themselves; this market-based approach will improve the efficiency and cost-effectiveness of emissions cuts.
3. The Clean Development Mechanism (CDM) will move from an early implementation phase to full operations. The CDM will encourage investments in developing-country projects that limit emissions while promoting sustainable development.
4. The Protocol's Adaptation Fund, established in 2001, will start preparing itself for assisting developing countries to cope with the negative effects of climate change.

Under the Kyoto Protocol, industrialized countries are to reduce their combined emissions of six major greenhouse gases during the five-year period 2008-2012 to below 1990 levels. The European Union, for example, is to cut its combined emissions by 8%, while Japan should reduce emissions by 6%. For many countries, achieving the Kyoto targets will be a major challenge that will require new policies and new approaches.

Only a few countries have not ratified the Protocol (www.unfccc.int). Australia and the United States have stated that they do not plan to do so. These two countries together account for over one-third of the greenhouse gases emitted by the industrialized world.

While developing countries (including Brazil, China, India and Indonesia) are Parties to the Protocol, they do not have emission reduction targets. Many developing countries have already demonstrated success in addressing climate change.

"Reducing the risks of global warming will require the active engagement of the entire international community. I urge the US and other major emitters without Kyoto targets to do their part by accelerating their national efforts to address climate change," said Ms. Waller-Hunter.

According to the Intergovernmental Panel on Climate Change (IPCC), the most up-to-date scientific research suggests that humanity's emissions of CO_2 and other greenhouse gases will raise global average temperatures by 1.4-5.8°C by the end of the century. They will also affect weather patterns, water resources, the cycling of the seasons, ecosystems and extreme climate events.

Scientists have detected many early signals of global warming, including the shrinking of mountain glaciers and Arctic and Antarctic sea-ice, reduced ice cover on lakes and rivers, longer summer growing seasons, changes in the arrival and departure dates of migratory birds, the spread of many insects and plants towards the poles, and much more.

For more information, see the UNFCCC web site (http://unfccc.int). For more information on the new Arctic Climate Impact Assessment report, see http://amap.no/acia. UNEP's climate change web site is at www.unep.org/themes/climatechange/. ◆

Lahore/Sialkot Declaration on Corporate Responsibility

The Third Global Forum for Sports and Environment (G-ForSE), organized by UNEP and the Global Sports Alliance (GSA), took place on 25-26 November in Lahore and Sialkot, Pakistan. Among other activities, participants heard a presentation by Michel Parraudin, President of the World Federation of the Sporting Goods Industry, on the need to continue promoting corporate social responsibility principles.

Following two days of discussions, the leaders of the sporting goods industry in Sialkot – who produce 60% of the soccer balls used in the world – unanimously endorsed a declaration calling for environmental concerns to be fully taken into account in their industry.

Industry leaders have also tackled the child labour issue in recent years, as well as committing themselves to continue to improve working and environmental standards in line with the UN Global Compact. ◆

The Lahore/Sialkot Declaration on Corporate Environmental Responsibility

In the Lahore/Sialkot Declaration, members of the sport related industries have agreed:

- to raise the importance of sustainable development and the environment in their work principles;
- to include the environment as a key factor in their non-financial reporting;
- to reduce and improve the use of water and energy during the production of sporting goods;
- to introduce cleaner technology, reduce the amount of toxic and chemical waste produced, and other pollutants in production facilities;
- to raise environmental awareness and action among company workers;
- to promote and sponsor children and youth activities linking good health, sport and environment;
- to participate in and support initiatives that seek to promote linkages between sport and the environment, including with athletes.

New indicators released to guide sustainable development in Asia-Pacific

On 17 November, during UNEP's second Subregional Environmental Policy Dialogue (SEPD) meeting in Bangkok, UNEP released indicators to assist Asia-Pacific countries to measure their progress towards sustainable development goals. Published in simple, graphical form, they allow policymakers to use benchmarks and assess trends in 30 different economic, social and environmental areas.

Staff at UNEP's Regional Resource Centre for Asia and the Pacific examined dozens of technical reports to obtain indicators such as population level, standard of living, availability of clean water, percentage of forest cover, air pollutant emissions and number of threatened species.

UNEP's Deputy Executive Director Shafqat Kakakhel said indicators were important tools for assessing well-being and performance against targets set in the UN Millennium Development Goals, at other international summits and against national plans. "Like our Global Environment Outlook reports, these indicators tell us that we are on an unsustainable development path and time is running out for a well-planned transition to policies that will ensure long-term well-being."

Overall, the indicators show progress in economic performance, poverty reduction and human health, but declines in the quality of land, air, water and biodiversity resources.

The SEPD panel comprises a government representative and a respected civil society person from the Central Asia, South Asia, Southeast Asia, Northeast Asia and the South Pacific sub-regions – each of which has an existing intergovernmental process, such as the Association of Southeast Asian Nations (ASEAN) – for developing environmental policy. The reports have been published for each of the five sub-regions.

The SEPD process was initiated by UNEP last year to engage government and civil society in discussions about how to prioritize responses to the environmental issues facing the region. This year's dialogue was hosted by the Government of Thailand and chaired by Mr. Kakakhel and Thailand's Minister for Environment and Natural Resources, Mr. Suwit Khunkitti. It paid particular attention to the role of technology support and capacity building in improving environmental performance.

Information was also shared on several regional initiatives to strengthen the environmental agenda: China's "circular economy", Japan's 3R (Reduce, Reuse and Recycle) approaches, and the waste management policies being adopted in the South Pacific. A strategy to combat the escalating problem of e-wastes – by-products and end-of-life products of the mobile telecommunications and computer boom – is being advocated by Thailand on behalf of the ASEAN.

The meeting coincided with the opening of the IUCN's World Conservation Congress in Bangkok, which was attended by 5000 environ-

mental activists from around the world under the theme "People and Nature – Only One World This Week".

The SEPD meeting presented an opportunity to review UNEP's programme of work in the region, coordinated by its Regional Office for Asia and the Pacific in Bangkok. UNEP Regional Director Surendra Shrestha said the office's focus was on science and assessment, policy advice and capacity building.

He added that knowledge management and partnerships were also important elements of the strategy, in order to avoid duplication of effort and build synergy between different agencies' efforts and country approaches.

"The indicator reports show there is often a shortage of reliable scientific data on which to base assessments about environment and development progress," said Mr. Shrestha. "This is a starting point which UNEP will use to assist countries to further develop monitoring and assessment capacity."

For more information, contact: Tim Higham, Regional Information Officer, UNEP, Tel: +66 2 2882127, E-mail: higham@un.org, Internet: www.rrcap.unep.org/policy2. Key findings are available at www.rrcap.unep.org/indicator. ◆

UNEP Division of Technology, Industry and Economics (DTIE) HIGHLIGHTS

New chemical trade names database

Several decisions taken by the Parties to the Montreal Protocol have highlighted UNEP's role in supporting information exchange on ozone depleting substances (ODS) related to customs and the prevention of illegal trade.

UNEP's new database on "Trade Names of Chemicals containing Ozone Depleting Substances and their Alternatives" is part of the response by UNEP DTIE's OzonAction Programme to these decisions, as well as to the needs expressed by members of the programme's Regional Networks of ODS Officers.

Information about trade names helps distinguish between imported chemical products containing ODS and those that contain non-ozone depleting alternatives. This information also makes it easier to track and combat illegal imports. Customs officials need information about the commercial trade names of imported products (as indicated on the product packaging and transaction/manifest papers), their chemical composition and their manufacturers. Moreover, many users in SMEs know the chemicals they use only by trade names. This is especially true, for example, of solvents and refrigerant mixtures.

The database on the trade names of chemicals has three linked components:

- trade name details (information about commercial products containing ozone depleting substances or their alternatives);
- chemical data sheets (chemical formulas, identifying numbers and other descriptive information about generic chemical substances);
- the Montreal Protocol phase-out schedule (identifies the specific reduction and phase-out time table applicable to different substances controlled under the Protocol).

Initial information in the database has been entered by the Information Clearinghouse of the UNEP DTIE OzonAction Programme through a multi-year collection effort. This information is based on various sources, including:

- product literature and technical information collected from individual companies, including through company web sites;
- assessment reports of the UNEP Technology and Economic Assessment Panel (www.teap.org) and its Technical Options Committees;
- information collected from government Ozone Officers who are members of the Regional Networks of ODS officers (www.uneptie.org/ozonaction/aboutus/networks.asp).

For the updating procedure, see:www.uneptie.org/ozonaction/library/tradenames.

The database of trade names is closely related to the international Green Customs initiative, a collaborative project that provides information and training materials for customs officials so that they can combat illegal trade in commodities of environmental concern (see the article "Fighting environmental crime and protecting the environment: UNEP's Green Customs Initiative" in *Industry and Environment* Vol. 27, No. 2-3, August-September 2004, p. 58).

For more information, contact : Rajendra Shende, Head, OzonAction Branch, UNEP Division of Technology, Industry and Economics (DTIE), Tour Mirabeau, 39-43 quai Andre-Citroën, 75739 Paris Cedex 15, France, Tel: +33 1 44 37 14 59, Fax: +33 1 44 37 14 74, E-mail: rmshende@unep.fr, Internet: www.uneptie.org/ozonaction/library/tradenames/main.asp. For information about the Green Customs Initiative, see www.uneptie.org/ozonaction/customs/home.htm. ◆

Companies fail to identify key social and environmental risks

Boards are failing to disclose to financial investors how environmental and social issues present strategic risks and opportunities for their businesses, according to an international review of corporate sustainability reports by UNEP, SustainAbility and Standard & Poor's. *Risk & Opportunity: Best Practice in Non-Financial Reporting* (see p. XX) finds that only three Top 50 reports assess the balance sheet implications of key environmental and social risks, despite the increasing importance of this information to analysts, investors, lenders, insurers and re-insurers.

The survey is the sixth international review of corporate environmental and sustainability reports by SustainAbility and UNEP. However, the 2004 survey is the first in partnership with Standard & Poor's – and the first to explore the link between credit ratings and the quality of companies' governance and disclosure of non-financial risks. Over 350 reports were submitted, and 50 were selected by an international independent expert committee for a full analysis. The top three overall are Co-operative Financial Services (UK), Novo Nordisk (Denmark) and BP (UK). Over half the Top 50 reports are new to the survey. Overall, there has been a significant increase in sustainability reporting quality since 2002.

"Corporate governance is the hottest topic," says SustainAbility Chairman John Elkington, "but recent scandals have meant most boards are focused on financial integrity issues – to the detriment of the bigger picture of non-financial risks and opportunities. The good news is that the overall quality of non-financial reporting has improved dramatically since our first benchmark survey in 1994. Now the challenge is to ensure that leading companies integrate their financial and non-financial accounting and reporting in ways that help analysts and rating agencies do their job properly. Most current attempts are resulting in 'Frankenstein's Monsters' stitched together from ill-marched parts, but 2005 will see leadership companies setting new standards."

"The early sustainability reporting pioneers are breaking new records and are being followed by growing numbers of companies from all over the world," underlines Monique Barbut, Director of UNEP's Division of Technology, Industry and Economics. "It is striking that 47 out of the 50 top reporters are users of the Global Reporting Initiative (GRI) Guidelines. Without doubt, sustainability reporting is moving mainstream. It is now critical that financial reporting and sustainable reporting become accepted as part of an integrated package."

For more information, contact: Robert Bisset, UNEP Spokesperson for Europe, Tel: +33 1 44 37 76 13, Mobile: +33 6 2272 5842, Email: robert.bisset@unep.fr. Copies of the report Risk & Opportunity: Best Practice in Non-Financial Reporting can be downloaded at www.sustainability.com. ◆

European sustainable consumption and production priorities identified

For the first time since the Word Summit on Sustainable Development in Johannesburg in 2003, European stakeholders were brought together at a meeting at Ostend, Belgium, on 25-26 November to address sustainable consumption and production (SCP) issues. The informal expert meeting was one of the regional Marrakech process consultations to develop a ten-year SCP framework.

More than 120 experts from 30 European countries participated, representing SMEs, retailers, banks, trade unions, consumer organizations, environmental organizations, local authorities and

Recommendations resulting from the first European Stakeholder Meeting on Sustainable Consumption and Production in Ostend, Belgium

- A comprehensive communication strategy is urgently required to pave the way for sustainable consumption and production decisions by individuals, promoting a change in mindset and behaviour.
- SCP should be endorsed from the highest political level.
- Consumer rights instruments in both developed and developing countries, including those regarding access to basic needs and information, need to be improved.
- The financial sector needs to increase investments in sustainable infrastructure.

research institutes. The meeting was organized by UNEP, together with the European Commission, in consultation with the United Nations Department of Economic and Social Affairs (UN DESA).

The meeting's main objectives were to formulate the European contribution to implementing the Johannesbug commitments on sustainable consumption and production (SCP); to recognize the crucial roles of individual stakeholders and encourage their commitment to SCP; to share information on ongoing activities and identify priority areas, as well as potential gaps in potential policies and tools; and to find means of implementing policies and activities.

For more information, contact: Bas de Leeuw, Coordinator, Sustainable Consumption Programme, Production and Consumption Branch, UNEP Division of Technology, Industry and Economics (DTIE), Tour Mirabeau, 39-43 quai André-Citroën, 75739 Paris Cedex 15, France, Tel: +33 1 44 37 14 24, Fax: + 33 1 44 37 14 74, E-mail: bas.deleeuw@unep.fr, Internet: www.uneptie.org/pc/sustain/10year/regional.htm. ◆

Methyl bromide use examined at Prague ozone layer conference

Governments represented at the 16th meeting of the Parties to the Montreal Protocol agreed that a global survey should be undertaken to determine the amounts of methyl bromide being used in quarantine and pre-shipment. This was one of several key decisions taken during the meeting, which ended in Prague on 27 November.

Methyl bromide is an agricultural fumigant. The quantities of this ozone-damaging chemical used by farmers have been established. (Methyl bromide also presents serious health risks to those handling and applying it). However, the levels used to treat shipments of big commodity crops such as rice and maize and consignments in wooden pallets remains unknown. Experts estimate that these levels were around 11,000 tonnes in 2002, increasing to18,000 tonnes in 2004. But this could be an underestimate. Not all countries have supplied full and accurate figures.

The global survey will be aimed at resolving such uncertainties. The survey may represent a first step towards controlling the levels of methyl bromide used in quarantine and pre-shipment. It will be carried out by scientific and technical experts associated with the Montreal Protocol.

Requests for critical use exemptions in cases where sufficiently effective alternatives are considered not to be available were examined, based on recommendations by the Protocol's scientific and technical experts. Under an agreement concluded in the mid 1990s, methyl bromide is scheduled for full phase-out in agriculture in developed countries next year. Methyl bromide consumption in 1991 was around 63,800 tonnes.

Users, including some in Australia, Europe and the United States, claim that current alternatives to methyl bromide in certain locations and for certain crops (e.g. strawberries and tomatoes) are not effective enough. Thus exemptions from the deadline for 2005 and 2006 have been requested.

The Parties to the Protocol agreed to exemptions for developed world farmers totalling just over 2600 tonnes in 2005, in addition to just over 12,150 tonnes agreed at a special meeting in March of this year. In view of recommendations by the Protocol's scientific and technical panels, it was agreed to grant developed world farmers just over 11,700 tonnes in exemptions in 2006.

An additional 3000 tonnes in exemptions have been approved "provisionally" for 2006. In the coming months these exemptions will be reviewed by scientific and technical experts, who will report back to governments on whether the exemptions should be formally granted – or whether reliable, ozone-friendly alternatives exist. The issue will be debated at a special one-day meeting scheduled for late June or early July of 2005. Governments have agreed that the levels of exemptions granted should take account of existing stockpiles of unused or recycled methyl bromide.

Other decisions made during the meeting included granting essential use exemptions for chlorofluorocarbon (CFC) use in metered dose inhalers prescribed to treat asthma and other health conditions. The United States was granted 1900 tonnes in exemptions, and Europe several hundred tones, for use of CFCs in inhalers that contain the chemical salbutamol.

Countries also approved the Prague Declaration on Enhancing Cooperation Among Chemical Related Multilateral Environmental Agreements.

Klaus Toepfer, Executive Director of UNEP, said he was "delighted that governments could agree on such a range of sometimes difficult issues [and that] the decisions were based on sound science."

He added that the Montreal Protocol "is without doubt one of the most successful, global, environment treaties and has been strengthened by the political commitment shown in Prague. I was pleased to note that throughout our discussions all governments stated clearly that they had every intention to phase out methyl bromide and that these critical use exemptions are temporary measures."

For more information, contact: Rajendra Shende, Head, OzonAction Branch, UNEP Division of Technology, Industry and Economics (DTIE), Tour Mirabeau, 39-43 quai Andre-Citroën, 75739 Paris Cedex 15, France, Tel: +33 1 44 37 14 59, Fax: +33 1 44 37 14 74, E-mail: rmshende@unep.fr, Internet: www.uneptie.org/ozonaction. ◆

International Seed Awards partnership finalists announced

Twelve partnership finalists for the first biennial Seed Awards were announced at the third IUCN – World Conservation Congress in Bangkok, Thailand, on 19 November. The Seed Awards provide a new international competition to find promising nascent entrepreneurial partnerships. Instead of being strictly monetary, these awards provide a combination of exposure, partnership-building, support services and facilitated access to potential funders.

Finalists were chosen from over 260 entries representing 66 countries. Five winners will be announced during the 13th Session of the UN Commission on Sustainable Development (UNCSD) in April 2004.

The finalists were cited for their potential to stimulate economic growth, promote social development and foster environmental stewardship at the local level. They also showed the potential to advance sustainable development in their communities and to contribute to international development goals. The economic, environmental and social issues their projects address include malnutrition, water provision, conservation of medicinal plants and fishing stock depletion. All the finalists share an innovative and entrepreneurial approach – addressing challenges while creating jobs and improving livelihoods.

Introducing the 12 finalist partnerships, IUCN Director General Achim Steiner pointed out that "Conservation cannot succeed if pursued in isolation – it must go hand in hand with economic and social development. These outstanding Seed finalists demonstrate how partnerships can contribute to this integration."

As the first stage of support, the finalists participated in a series of workshops and meetings at the Congress in November to build their capacities and broaden their networks. They will now receive individually targeted support services designed to give the proposed partnership every chance of success.

UNEP Executive Director Dr. Klaus Toepfer pointed out that "The 12 finalists and the hundreds of submissions to the Seed Awards only

scratch the surface of the tremendous potential of entrepreneurial partnerships to contribute to sustainable development and the Millennium Development Goals. The 1200 organizations involved in the award submissions demonstrate the diversity of local level entrepreneurs that are eager to pool their energies, knowledge and resources."

The Seed (Supporting Entrepreneurs in Environment and Development) Initiative aims to inspire, support and build the capacity of locally driven entrepreneurial partnerships to contribute to the delivery of the Millennium Development Goals and the Johannesburg Plan of Implementation. The Initiative was announced at Durban, South Africa, in December 2003. The Seed Awards are one aspect of its activities.

The Seed Initiative is a partnership between IUCN – The World Conservation Union, UNEP and the United Nations Development Programme (UNDP), with support from the governments of Germany, Norway, the United States and the United Kingdom and the UN Global Compact. Collaborating organizations include Partnerships Central and the Global Public Policy Institute (GPPi). The Secretariat is operated by IUCN.

For more information, contact: Cornis Van der Lugt, UNEP Division of Technology, Industry and Economics (DTIE), Tour Mirabeau, 39-43 quai Andre-Citroën, 75739 Paris Cedex 15, France, Tel: +33 1 44 37 14 45, Fax: +33 1 44 37 14 74, E-mail: cornis.lugt@unep.fr; or darian.stibbe@seedinit.org, Tel: +44 7789 263616, Internet: www.seedawards.org. ◆

UNEP "SOLdinars" project to finance 30,000 domestic solar water heaters in Tunisia

The new Mediterranean Renewable Energy Centre (MEDREC) in Tunis, Tunisia, will provide training for experts, dissemination of information, networking and financial support to pilot projects in the renewable energies field. UNEP has announced the first such project, a loan facility designed to strengthen the market for solar water heating in Tunisia. Called "SOLdinars" (from the French "solaire" for "solar" and the Tunisian currency "dinars"), this pilot project will, according to plans, finance 30,000 domestic solar water heaters in Tunisia over the next three to four years.

The Italian government is the main funder of the SOLdinars project. Other partners include the Tunisian National Agency for Energy Conservation and the Tunisian State utility, Société Tunisienne de l'Electricité et de Gaz (STEG).

"Even though a solar hot water system can pay back the initial investment in as little as six years, the capital cost presents an impossible financial barrier for many families," says Monique Barbut, Director of UNEP's Division of Technology, Industry and Economics. "The new UNEP programme will provide an interest rate subsidy and a capital cost subsidy that will significantly lower the solar water financing."

SOLdinar loans will be offered on 60-month terms, with an interest rate of approximately 4% (lower than the rate for mortgage finance). Current consumer loans carry an interest rate three times higher. Monthly loan repayments will be structured to match current monthly spending on other forms of energy.

It is also envisaged that the project will contribute to the creation of a sustainable market for solar water heating systems and bring social, economic and environmental benefits to Tunisia.

MEDREC, a donor-funded project within the Tunisian National Agency for Energy Conservation, will give an important boost to large-scale use of wind, solar and other renewable energies in the Mediterranean region of North Africa. Established by the Tunisian Ministry for Industry and Energy with funding from the Italian Ministry for the Environment and Territory (IMET), the centre will promote and develop renewable technologies across this region.

"We are taking a big step forward towards creating a strong market environment for renewable energy in the Mediterranean region," says Dr. Corrado Clini, Director General of the Italian Ministry for the Environment and Territory. "MEDREC will help us reach the objective we identified at the 2002 World Summit on Sustainable Development Johannesburg – to provide renewable energy to 100 million people in the next decade."

Dr. Clini stresses that "Finance facilities such as SOLdinars are needed to help developing countries tap their substantial renewable energy potential, create sustainable jobs, and reduce the environmental impacts of energy use such as air pollution and climate change."

MEDREC is a member of the Global Network on Energy for Sustainable Development (GNESD), a UNEP initiated activity that brings together leading centres working on energy and sustainable development issues.

With the support of the Italian Ministry of Environment and Territory, UNEP has also begun an effort, called MedREP, to promote increased investment in the renewable energy sector in the southern Mediterranean. The key objectives of MedREP are to investigate different options for increasing finance flows to renewable energy companies and projects in target countries, and to help structure various support mechanisms that help lenders and investors scale up financing to this clean energy sector.

For more information, contact: Myriem Touhami, Energy Branch, UNEP Division of Technology, Industry and Economics (DTIE), Energy and Ozone Unit, Tour Mirabeau, 39-43 quai André-Citroën, 75739 Paris Cedex 15, France, Tel: +33 1 44 37 16 30, Fax: + 33 1 44 37 14 74, E-mail: myriem.touhami.unep.fr, Internet: www.uneptie.org/energy; or Ezzeddine Khalfallah, Head of the Tunisian National Agency for Energy Conservation, Tel: +216 71 7283 477. ◆

Buenos Aires: the CDM from the financial sector perspective

At COP 10 (see UNEP Focus), the Climate Change Working Group (CCWG) of the UNEP Finance Initiative held a side event to launch its fourth CEO Briefing. This document examines the financing of climate solutions, with particular emphasis on the Kyoto Protocol's Clean Development Mechanism (CDM) and, more specifically, the risks and opportunities associated with CDM projects as viewed by the financial sector.

As the document explains: "The potential market size for Certified Emission Reductions (CERs) is remarkable. According to the EU, an estimated annual 430 million tonnes of CO_2 must be reduced worldwide in order to meet the Kytoto Protocol's emissions reduction targets. It is hoped that a significant share of this volume will come from CDM projects. This will require, however, significant financial resources. The financial sector is often asked to play an important role in this respect, and in particular, to provide project financing and/or insurance for CDM projects."

See www.unepfi.org/events/2004/cop10/index.html. For more information, contact: Lisa Petrovic, E-mail: lisa.petrovic@unep.ch. ◆

Books & Reports

General

Putting Partnerships to Work: Strategic Alliances for Development between Government, the Private Sector and Civil Society

At Johannesburg in 2002, partnerships between government, civil society and business were proposed as a means of achieving poverty reduction targets. *Putting Partnerships to Work* is about how partnerships work, the types of outcomes that can be achieved, and necessary conditions for partnerships to be successful. It focuses on the oil, gas and mining industries, as these sectors have tended to be the primary drivers of foreign direct investment in developing countries. The material presented is based on the 1998-2002 Business Partners for Development (BPD) programme, which looked at the experience of specific natural resource operations around the world. The purpose of this programme was to assess how partnerships involving companies, government authorities and civil-society organizations could be an effective means of reducing social risks and of promoting community and regional development.

Michael Warner and Rory Sullivan (eds.) (2004). Greenleaf Publishing Ltd, Aizlewood's Mill, Nursery Street, Sheffield S3 8GG, UK, Tel: +44 114 282 4375, Fax: +44 114 282 3476, E-mail: info@greenleaf-publishing.com, Internet: www.greenleaf-publishing.com. ISBN 1874719721. Hbk, 336p.

Natural Allies: UNEP and Civil Society

Besides describing UNEP's structure and role, *Natural Allies* explains how civil society can interact directly with governments, whose decisions guide UNEP's work. It also explains how civil society can participate in UNEP activities, e.g. scientific assessments, the development and implementation of policy and law, the raising of public awareness, and working with business and industry. The advice of many civil-society organizations consulted during the peer review process has been incorporated. As Klaus Toepfer, UNEP's Executive Director, emphasizes in the Introduction, this book "is targeted at civil society and should be read from a civil society point of view." It is also available in French with the title *Alliés Naturels : Le PNEU et la société civile.*

(2004). UNEP, Division of Policy Development and Law, Major Groups and Stakeholders Branch, PO Box 30552, Nairobi 00100, Kenya, Tel: +254 20 621234, Fax: +254 20 623927, E-mail: civil.society@unep.org, Internet: www.unep.org/dpdl/cso. This publication can be ordered from UNEP's online bookshop (www.earthprint.com) or by mail from Earthprint Limited Orders Dept., PO Box 119, Stevenage, Hertfordshire SG14TP, United Kingdom, Tel: +44 14 3874 8111, Fax: +44 14 3874 8844, E-mail: orders@earthprint.com. ISBN 97-807-2443-6. Pbk, 80p.

Tomorrow's History: Selected Writings of Simon Zadek, 1993-2003

Simon Zakek is one of the architects of the corporate responsibility movement. His writings on economics, corporate accountability, stakeholder dialogue, social and ethical auditing and reporting, and many other subjects have attracted widespread attention. This collection reflects Zadek's involvement with organizations such as the New Economics Foundation, one of the pioneers in the development of social auditing, sustainability indicators, community finance and other concepts. It also illustrates his contribution to the creation of the Ethical Trading Initiative and of Accountability (of which he is the CEO), as well as his work with companies like The Body Shop and Ben & Jerry's and other civil society organizations.

Simon Zadek (co-edited by Peter Reynard) (2004). Greenleaf Publishing Ltd (see above). ISBN 1874719853. Pbk, 360p.

The Triple Bottom Line: Does it all add up? Assessing the sustainability of business and CSR

The concept of the "triple bottom line" (TBL) – that business activity can simultaneously deliver financial, social and environmental benefits – was introduced in the early 1990s. This collection reviews what has already been achieved in stimulating change in corporate culture, and in bringing business to an appreciation of the importance and benefits of corporate social responsibility (CSR) and good environmental performance. It also explores the conceptual and practical limits of the TBL metaphor and sets out what can be achieved through regulation and legislation. Professional procedures for environmental accounting and management and social accounting are presented. The 22 contributors have widely different backgrounds and experience.

Adrian Henriques and Julie Richardson (eds.) (2004). Earthscan, 8-12 Camden High St., London NW1 0JH, United Kingdom, Tel: +44 20 7387 8558, Fax: +44 20 7387 8998, E-mail: earthinfo@earthscan.co.uk, Internet: www.earthscan. co.uk. ISBN 1-84407-016-6. Pbk, 186 p.

Teaching Business Sustainability. Vol. 1: From Theory to Practice

The first volume of *Teaching Business Sustainability* looks at the state of the art of teaching business sustainability worldwide, and at the teaching practices and tools that achieve the best results. As a management discipline, sustainability is an evolving field. There is still a need to combat the erroneous idea that some environmental and social issues represent non-value-added effort. The 23 submissions in this volume are divided into three thematic groups: "Theory, Critique and Ideas," "Learning from Current Practice" and "Tools, Methods and Approaches." *Volume 2: Case Studies* will be available in 2005.

Chris Galea (ed.) (2004). Greenleaf Publishing Ltd (see above). ISBN 1874719543. Hbk., 342p.

Profile of UNEP Capacity Building and Technology Support Activities 2004

This publication profiles UNEP's capacity building and technology support activities, with summary information given for each project. The projects are arranged in categories, e.g. Environmental Assessment, Biodiversity, Climate Change and Atmosphere, Energy, Water. Technology support activities carried out by UNEP over the years are described under these categories. Thus the Joint Geophysical Imaging (JGI) Methodology for Geothermal Reservoir Assessment is found under Energy and the phytotechnologies project under Water. Projects are also organized according to their geographical focus.

(2004). Capacity Building Branch, UNEP Division of Environmental Policy Implementation, PO Box 30552, Nairobi 00100, Kenya. Tel: +254 20 623485, E-mail: depiinfo@unep.org, Internet: www.unep.org.

Technological Choices for Sustainability

Technological Choices for Sustainability critically evaluates current scientific work related to defining (and making progress towards) sustainability. It aims to help achieve a common understanding of how such progress can be made by optimizing technological development, environmental impact and socio-economic factors. It also identifies major trends in methodologies that assist progress towards sustainability. Chapters by over 50 contributing authors are grouped under the headings "Framing the Issue of Sustainability", "Sustainable Pathways" and "Sustainability Metrics". Many of these chapters result from papers presented and discussed at a NATO sponsored Advanced Research Workshop in Slovenia in

2002. The book's final section presents a summary of panel discussions at that workshop.

Suhas K. Sikdar, Petar Glavic and Ravi Jain (eds.) (2004). Springer-Verlag (Berlin, Heidelberg, New York). Internet: springeronline.com. ISBN 3-540-21131-4. Hbk., 441p.

Cleaner Production Companion

The information on this CD-ROM is intended to facilitate a better understanding of how stakeholders (e.g. businesses of all sizes, governments, financing institutions and communities) can implement cleaner production and create stronger lengths among each other. Included are video clips, guidance manuals, training packages, case studies and interactive quizzes. There are references to material relating to cleaner production found in more than 160 documents. Some of the UNEP publications compiled here are presented in soft copy format. Users can keep aware of updates by consulting the Internet address below.

(2004). Production and Consumption Branch, UNEP Division of Technology, Industry and Economics (DTIE), Tour Mirabeau, 39-43 quai André-Citroën, 75739 Paris Cedex 15, France. Tel: +33 1 44 37 14 50, Fax: +33 1 44 37 14 74, E-mail: unep.tie@unep.fr. Internet: www.uneptie.org/pc/cp/home.htm. ISBN 92-807-2494-0. CD-ROM.

The Use of Economic Instruments in Environmental Policy: Opportunities and Challenges

Economic instruments can increase efficiency by giving polluters greater flexibility in deciding how to meet their targets while encouraging the design of new and improved abatement technologies. They can also lower regulatory expenditures, as less monitoring and surveillance will often be required. Some economic instruments actually raise revenue for governments. This report will help policymakers (especially those in the developed world) identify, evaluate and apply economic instruments that address a country's environmental problems within national and local circumstances.

(2004). Economics and Trade Branch, UNEP Division of Technology, Industry and Economics (UNEP DTIE), 11-13 chemin des Anémones, CH-1219 Geneva, Switzerland. Tel: +41 22 917 82 43, Fax: +41 22 917 80 76, E-mail: elb@unep.ch, Internet: www.unep.ch/etu. ISBN 92-807-2391-X. Pbk, 117p.

Economic Instruments in Biodiversity-Related Multilateral Agreements

It is now generally recognized that the loss and decline of biological diversity, and its economic and ecological consequences, are urgent global environmental problems. This study looks at the current and potential role of economic instruments – and their possible limitations – in the context of the Convention on Biological Diversity (CBD), the Convention on International Trade in Endangered Species of Flora and Fauna (CITES), and the Ramsar Wetlands Convention. It summarizes the main types of economic instruments relevant to biodiversity protection and identifies the three MEAs' main provisions, economic instruments and incentives. Some areas where use of economic instruments could be developed are suggested. Conditions for the successful implementation of such instruments are also discussed.

(2004). Economics and Trade Branch, UNEP Division of Technology, Industry and Economics (UNEP DTIE), 11-13 chemin des Anémones, CH-1219 Geneva, Switzerland. Tel: +41 22 917 82 43, Fax: +41 22 917 80 76, E-mail: elb@unep.ch, Internet: www.unep.ch/etu. ISBN 92-807-2390-1. Pbk, 114p.

Analyzing the Resource Impact of Fisheries Subsidies: A Matrix Approach

Under the conditions found in most fisheries today, most subsidies have the potential to harm fish stocks. The need to reform fisheries subsidies was highlighted at the World Summit on Sustainable Development in 2002. UNEP initiated a project the following year addressing different types of fishery subsidies under various regulatory and environmental conditions. The resulting study, *Analyzing the Resource Impact of Fisheries Subsidies: A Matrix Approach*, provides a classification of these subsidies and a systematic assessment of the impact of eight subsidization categories, taking into account a fishery's level of exploitation and its management regime.

(2004). Economics and Trade Branch, UNEP Division of Technology, Industry and Economics (UNEP DTIE), 11-13 chemin des Anémones, CH-1219 Geneva, Switzerland. Tel: +41 22 917 82 43, Fax: +41 22 917 80 76, E-mail: elb@unep.ch, Internet: www.unep.ch/etu. ISBN 92-807-2491-6. Pbk, 55p.

Risk & Opportunity: Best Practice in Non-Financial Reporting

The financial sector (insurers, reinsurers, lenders, investors, analysts) is increasingly aware of a range of non-financial issues. Even the best current non-financial reporting by companies may not yet meet its needs. Nevertheless, a convergence of the financial and non-financial worlds is under way. *Risk & Opportunity* considers the question: Is the glass of non-financial (and wider sustainability) reporting now half full, as enthusiasts might argue, or half empty, as some critics allege? It concludes that the evidence suggests a positive assessment, though there are major gaps to be closed in the linked fields of disclosure, reporting and communication. *Risk & Opportunity* is a joint production of UNEP, Sustainability and Standard & Poor's.

"It's half full"	Several thousand companies, including many of the world's largest, now report corporate governance is now firmly on the agenda.	The leading edge of reporting is expanding to embrace the wider economic bottom line. 2004 sees a raft of new entrants and rapidly climbing scores.
"It's half empty"	Well over 50,000 multinational companies still fail to report.	However high the 2004 scores, the focus is still on reports rather than action.
	Few companies link their "non-financials" with their "financials"	Very few boards understand the connections between corporate governance and the triple bottom line agenda

From Risk & Opportunity: Best Practice in Non-Financial Reporting

(2004). SustainAbility Ltd, 20-22 Bedford Row, London WC1R 4EB, UK. Tel: +44 20 7269 6900; Fax: +44 20 7269 6901, Internet: www.sustainability.com. ISBN 1-903168-12-0. Pbk, 52p.

Incorporating Resource Impact into Fisheries Subsidies Disciplines: Issues and Options. A Discussion Paper

Along with related developments in other intergovernmental fora, including UNEP, the FAO and the OECD, World Trade Organization talks raise new questions and present important opportunities and challenges concerning the promotion of sustainable fisheries. Building on the study *Analyzing the Resource Impact of Fisheries Subsidies: A Matrix Approach* (see above), UNEP commissioned the author of this discussion paper, Gareth Porter, to analyze and investigate options for incorporating impacts on resources into new World Trade Organization disciplines on fisheries subsidies.

(2004). Economics and Trade Branch, UNEP Division of Technology, Industry and Economics (DTIE), 11-13 chemin des Anémones, CH-1219 Geneva, Switzerland. Tel: +41 22 917 82 43, Fax: +41 22 917 80 76, E-mail: elb@unep.ch, Internet: www.unep.ch/etu. ISBN 92-807-2492-4. Pbk, 20p.

Resource Kit on Sustainable Consumption and Production

This UNEP publication consists of colourful fact sheets on 12 different topics: advertising, ecodesign, energies, food, housing, leisure, lifestyles, mobility, NICT, textiles, tourism and water.

Each provides background information by analyzing the impacts of related activities and featuring examples of good practices around the world. Specific UNEP activities related to the topic are also mentioned. There are tips to help individuals, companies and local authorities put environmental principles into practice, and websites are indicated for further information. The *Resource Kit* was funded by the French Ministry of Ecology and Sustainable Development. It is available in French with the title *Modes de consommation et de production durables – Pour en savoir plus.*

(2004). Production and Consumption Branch,

UNEP Division of Technology, Industry and Economics (UNEP DTIE), Tour Mirabeau, 39-43 quai André-Citroën, 75739 Paris Cedex 15, France, Tel: +33 1 44 37 14 50, Fax: +33 1 44 37 14 74, E-mail: unep.tie@unep.fr, Internet: www.uneptie.org. ISBN 92-807-2446-0. Folder and looseleaf pages.

Energy

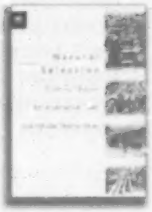
Cleaner Production Energy Efficiency Manual: Guidelines for the Integration of Cleaner Production and Energy Efficiency

The project during which these Guidelines were developed saw National Cleaner Production Centres (NCPCs) in six countries incorporate energy management principles into the cleaner production resource efficiency approach. The NCPC of India prepared the draft manual, which was subsequently used by NCPC staff in China, the Czech Republic, Hungary, India, the Slovak Republic and Vietnam. The *Cleaner Production Energy Efficiency Manual* has three parts. Part 1 presents the foundations of cleaner production-energy efficiency (CP-EE) integration, introducing its benefits and developing a five-step methodology. Part 2 contains two technical modules. Part 3 is a tools and resources section. Hyperlinks allow users to navigate within the Manual and to access CD and internet-based tools.

(2004). UNEP Division of Technology, Industry and Economics (UNEP DTIE), Tour Mirabeau, 39-43 quai André-Citroën, 75739 Paris Cedex 15, France, Tel: +33 1 44 37 14 50, Fax: +33 1 44 37 14 74, E-mail: unep.tie@unep.fr, Internet: www.uneptie.org/pc/cp/home.htm. ISBN 92-807-2494-0. CD-ROM.

Natural Selection: Evolving Choices for Alternative Fuels and Vehicle Technologies

Despite the acknowledged benefits – and considerable investment by governments and the private sector – none of the available alternative fuel/ vehicle options has yet really overcome all the technical, market and policy barriers. This is largely because no common policy or strategy exists. The purpose of this UNEP publication is to help overcome these barriers. The first part presents information on different alternative fuels, including descriptions of each technology, current market position, the state of development, performance, environmental impact, health and safety concerns, and costs. The second describes policy options and actions that can be undertaken by governments, industry and consumers.



(2003). UNEP Division of Technology, Industry and Economics (UNEP DTIE), Tour Mirabeau, 39-43 quai André-Citroën, 75739 Paris Cedex 15, France, Tel: +33 1 44 37 14 50, Fax: +33 1 44 37 14 74, E-mail: unep.tie@unep.fr, Internet: www.uneptie.org. ISBN 92-807-2431-2. Pbk, 36p.

National/Regional

Coltan Mining in the Democratic Republic of Congo: How tantalum-using industries can commit to the reconstruction of the DRC

Among other uses, tantalum is a vital material for capacitors in miniaturized and portable electronic equipment. In 2002 a worldwide tantalum shortfall precipitated a Klondike-style rush into the World Heritage Site national parks of the Democratic Republic of Congo, where coltan (a tantalum-bearing ore) is easily surface-mined with shovels and sieves. As there is a direct relationship between illegal coltan exploration and the bloody conflict in the DRC, two options have been considered: totally banning trade in coltan from the DRC or regulating its mining and export. This report, which favours the second option, outlines the steps involved in pursuing regulation.

Karen Hayes and Richard Burge (2003). Fauna & Flora International, Great Eastern House, Tenison Road, Cambridge CB1 2TT, UK, Tel: +44 12 2357 1000, Fax: + 44 12 2346 1481, Internet: publications @fauna-flora.org. ISBN 1-903703-10-7. Pbk, 60p.

From Conflict to Sustainable Development: Assessment and Clean-up in Serbia and Montenegro

UNEP has been assessing the environmental consequences of the Kosovo conflict since 1999. It has also implemented a project to clean up serious conflict-related environmental damage in Serbia and Montenegro. This report documents in detail how UNEP has gone about assessing the conflict's environmental consequences. Through its activities fresh drinking water has been secured, contaminated soil and groundwater remediated, hazardous waste removed and treated, and wastewater treatment capacities rehabilitated. Environmental monitoring stations have also been installed, and national and local environmental management capacities have been strengthened. This model has been successfully replicated by UNEP in other conflict areas, including Afghanistan, Iraq, the Occupied Palestinian Territories and Liberia.

(2004). United Nations Environment Programme, PO Box 30552, Nairobi, Kenya, Tel: +254 2 62134, Fax: +254 2 624489/90, E-mail: cpiinfo@unep.org, Internet: www.unep.org. Copies of this report may be ordered from SMI (Distribution Services) Limited, PO Box 119, Stevenage, Hertfordshire SG14TP, UK, Tel: +44 14 3874 8111, Fax: +44 14 3874 8844, Internet: www.earthprint.com. UNEP also has an online bookstore at www.earthprint.com. ISBN 92-807-2438-X. Pbk, 55p.

Chemicals/pollution/accidents

Childhood Pesticide Poisoning: Information for Advocacy and Action

Pesticide poisoning disproportionately affects infants and children. The number of children exposed to excessive pesticide levels worldwide while working, or by directly ingesting pesticide products, is unknown. Based on experience in many countries, however, this number is likely to be large. *Childhood Pesticide Poisoning* presents information for advocacy and action directed at reducing pesticide poisoning and addressing its effects on children and women. The main text was prepared for UNEP, the Food and Agriculture Organization (FAO) and the World Health Organization (WHO) by Dr. Lynn Goldmann, Professor of Environmental Life Sciences at John Hopkins School of Hygiene and Public Health.

(2004). For more information, contact: UNEP Chemicals Branch, International Environment House, 11-13 Chemin des Anémones, CH-1219 Châtelaine, Geneva 10, Switzerland, Tel: +41 22 917 81 11, Fax: +41 44 37 14 74, E-mail: chemicals@unep.ch, Internet: www.chem.unep.ch.

Concise International Chemical Assessment Documents

Concise International Chemical Assessment Documents (CICADs) are the latest in a family of publications from the International Programme on Chemical Safety (IPCS) – a cooperative programme of UNEP, the World Health Organization (WHO) and the International Labour Organization (ILO). CICADs join the Environmental Health Criteria Documents (EHCs), many of which have been noted over the years in *Industry and Environment*, as authoritative documents on the risk assessment of chemicals.

CICADs provide summaries of the relevant scientific information concerning the potential effects of chemicals on human health and/or the environment. They are usually based on selected national or regional evaluation documents or on existing EHCs.

International Chemical Safety Cards on the rele-

vant chemical(s) are attached at the end of the CICAD to provide concise information on the protection of human health and on emergency action. These cards are produced in a separate peer-reviewed procedure at IPCS; they may be completed by information from IPCS Poison Information Monographs (PIM), similarly produced separately from the CICAD process.

Each CICAD includes a summary in French and in Spanish.

All of the CIADs can be downloaded at www.who.int/pcs/ra_site/cicads.htm. The last five titles to published are:

No. 57: Glyoxal. ISBN 924153057X. Pbk, 43p.

No. 58: Chloroform. ISBN 9241530588. Pbk, 58p.

No. 59: Asphalt (Bitumen). ISBN 9241530596. Pbk, 50p.

No. 60: Chlorobenzenes other than Hexachlorobenzene: Environmental Aspects. ISBN 924153060X. Pbk, 55p.

No. 61: Hydrogen Cyanide and Cyanides: Human Health Aspects. ISBN 924153061. Pbk, 67p.

(2004). For more information, contact: Marketing and Dissemination, World Health Organization, 1211 Geneva 27, Switzerland, Fax: +41 22 791 48 57, E-mail: bookorders@who.int, Internet: www.who.int/pcs/ra_site/cicads.htm.

Restructured ADR applicable as from 1 January 2005. European Agreement Concerning the International Carriage of Dangerous Goods by Road

The purpose of the European Agreement concerning the International Carriage of Dangerous Goods by Road (ADR), which entered into force in 1968, is to increase the safety of international road transport of dangerous goods. The Agreement itself is short and simple. The key article is the second, which states that apart from some goods that are excessively dangerous, other dangerous goods may be carried internationally in road vehicles subject to compliance with the conditions laid down in Annex A (packaging and labelling) and Annex B (construction, equipment and vehicle operation).

Annexes A and B have been amended and updated regularly since ADR entered into force. The competent authorities of all Contracting Parties to ADR as of 1 June 2004 are listed. Queries concerning the application of ADR should be directed to the relevant competent authority. Additional information is also available on the UNECE Transport Division website below.

The *Restructured ADR* is available in English, French and bilingual editions, in book form or in a CD-ROM version. A set of book plus CD-ROM is also available.

United Nations Economic Commission for Europe (UNECE) (2004). For more information see: www.unece.org/trans/danger/publi/adr/adr_e.html. ISBN 92-1-139097-4 (set of 2 volumes Annexes A and B). Pbk, 607p (each volume).

European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways (ADN)

The ADN was adopted in 2000. Consisting of a main legal text and annexed Regulations, it aims to establish the same high level of safety throughout the European Inland Waterways Network. The annexed Regulations (revised as of 1 January 2005) concern dangerous substances and articles, their carriage in packages and in bulk, and the construction and operation of vessels. Inspections, certificates of approval and other topics are also addressed.

For more information about the forms in which the ADN is published (or to download the Regulations in English, French and Russian in pdf) go to the UNECE Transport Division website below.

United Nations Economic Commission for Europe (UNECE) (2004). For more information see: www.unece.org/trans/danger/danger.htm. ISBN 9211391024. Pbk, Vol. 1, 425p; Vol. 2, 505p.

Web Site Highlights

www.earthdive.com

Snorkellers and scuba divers everywhere are being enlisted to help save the world's oceans and seas. A new initiative called Earthdive is urging professional and amateur divers to record the health of the marine environment, including coral reefs, mangrove swamps and coastal waters. The scheme is supported by UNEP through its World Conservation Monitoring Centre (WCMC) in Cambridge, England. Its main feature centres on encouraging members to record findings from their dives on the Earthdive website. By doing so, they will be contributing scientific data on key indicator species to build a Global Dive Log (GDL).

For more information, contact: Chris Long, Founder and Director, E-mail: chris@earthdive.com, or Angela Bawtree, Director, E-mail: angela@earthdive.com, Tel: +44 79 90 72 5700.

www.grid.unep.ch/waste/

Vital Waste Graphics was published for the seventh meeting of the Conference to the Parties of the Basel Convention (COP7) on 25-28 October. It presents facts and figures concerning a wide spectrum of issues relevant to waste today, based on clear and user-friendly graphics. These include problematic waste streams and cross-cutting themes linked to sustainable development such as climate change and poverty, as well as hopes and solutions.

For more information, see www.basel.int. Vital Waste Graphics was initiated by the Basel Convention Secretariat and produced in partnership with UNEP's Division of Environmental Conventions (DEC), Grid-Arendal and UNEP's Division of Early Warning Assessment-Europe.

www.iea-pvps.org

The Photovoltaic Power Systems Programme is a collaborative R&D agreement established within the International Energy Agency (IEA) in Paris. It carries out projects concerned with the application of solar photovoltaic electricity. IEA PVPS operates worldwide through a network of national teams in member countries.

For more information, contact: PV Power Newsletter, The Manor House, Chineham Court, Lutyens Close, Hants RG24 8AG, UK, E-mail: itpowergroup.com.

www.iswa.org

The International Solid Waste Association (ISWA) is an independent, non-profit association working to promote and develop sustainable waste management worldwide. Membership is open to individuals and organizations from the scientific community, public institutions, public and private companies, consultants and manufacturers working in the field of (or interested in) waste management. There are ISWA members in more than 70 countries.

For more information, contact: ISWA General Secretariat, Overgaden Oven Vandet 48 E, DK-1415 Copenhagen K, Denmark, Tel: +45 3296 1588, Fax: +45 3296 1584, E-mail: iswa@inet.uni2.dk.

www.soi.wide.ad.jp/class/20020015/files/ban

Shigeru Ban is known for his innovative residential, installation and humanitarian projects, and for research into the use of unconventional building materials (e.g. paper tubing). For this Japanese architect, who was a consultant to the UN High Commissioner for Refugees from 1995 to 2000, the social responsibility of an architect today "is tied to the proliferation of global natural and man-made disasters". His work is guided by "the search for ways to build that do not exacerbate hazardous natural conditions, and to apply architectural ingenuity to binding the worst wounds inflicted by disaster." Among other sites, see: www.designboom.com/ history/ban.html.

Paper tube chair by Shigeru Ban

THE UNEP DIVISION OF TECHNOLOGY, INDUSTRY AND ECONOMICS

To our readers

Since 1978, the UNEP quarterly review *Industry and Environment* has served as a forum for exchanging information and experience. "The review" – as we usually refer to it – has covered a large number of topics of broad international interest, with contributions by industry managers, people working in governments and institutions, and others active in the rapidly evolving field of environmentally related practices in industry.

In the review's first decade there was a particular focus on environmental impacts of individual industrial sectors (e.g. pulp and paper, iron and steel, hydrocarbons and chemicals). Readers, contributors and others involved in UNEP work also shared examples of best practices for waste minimization and looked at ways to prevent industrial accidents, among other topics.

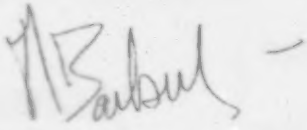
After the launch of UNEP's Cleaner Production programme in 1990, the review regularly addressed the issues of energy efficiency, water conservation and other aspects of more sustainable resource use. Industry's contributions to climate change, the environmental effects of tourism, and education and training are examples of other themes that attracted growing attention in the 1990s.

Over the years *Industry and Environment* has reflected developments in the international environmental field, as well as changes in the work and organization of UNEP itself. This issue reports on SCP8, the high-level meeting held in Monterrey, Mexico, in November 2004, where participants focused on the full sustainable consumption and production agenda.

Industry and Environment is being discontinued with this issue. Nevertheless, sharing information and experience remains one of UNEP DTIE's main activities. Our networking capacities continue to expand with respect to our activities, and to the number of countries and individuals dedicated to the goal of implementing good practices worldwide in sectors of business and industry.

Many people and organizations in both developing and developed countries have contributed to the success of this well received publication. In addition to the **authors of the hundreds of articles we have published**, and the Editorial Board, I would especially like to acknowledge the invaluable contributions of: **Françoise Ruffe**, who has coordinated production of the review since 1994; **Thalia Stanley**, who has been responsible for the review's graphic design since 1993; and **John Smith**, our consultant editor since 1989.

I also wish to thank our many readers around the world who have supported the review. I encourage them to continue to keep up to date on UNEP DTIE's work through our other publications and our web site (www.uneptie.org).



Director
Division of Technology, Industry and Economics
United Nations Environment Programme

LAST ISSUE

Industry and Environment

a publication of the United Nations Environment Programme
Division of Technology, Industry and Economics

For over 20 years, the quarterly *Industry and Environment* has provided a forum for exchanging information and experience. Industry managers, government officials, researchers and others active in the field of sustainable industrial development have contributed articles on subjects of broad international interest and specific themes such as retailing, construction, small and medium enterprises, water and development, to name some of the most recent topics.

Industry and Environment will be discontinued at the end of 2004. Discontinuation of the quarterly coincides with a change in emphasis in the strategy of UNEP's Division of Technology, Industry and Economy. Other DTIE publications will continue to help achieve UNEP's basic goal of sharing practical and technical information about sustainability issues and challenges.

Previous issues of *Industry and Environment*

Issues from 2000 onwards may be downloaded from UNEP DTIE web site: http://www.uneptie.org/media/review

Copies of back issues from 1988 onwards may also be ordered from:

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